State of Michigan
Department of Environmental Quality

Water Resources Division
420 Fifth Street
Gwinn MI, 49841-3004
906-346-8300

File Number 11-52-0075-P

Date: January 23, 2012

PUBLIC NOTICE

The Marquette County Road Commission, 1610 N. Second, Marquette , MI 49849, has applied to this office for a permit under authority of Part 301, Inland Lakes and Streams, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. The applicant proposes to construct new 21.4 mile long north/south primary county road between US-41 and County Road Triple A. The proposed road will include a combination of improvement to existing roads, relocated sections of existing roads, and new road. The stated purpose of the road is to connect and improve emergency, commercial, industrial, commercial and recreational access to a somewhat isolated, but key industrial, commercial and recreation area and to reduce truck travel from this area through Marquette County population centers. The project will impact 25.81 acres of wetland, provide 49.4 acres of wetland mitigation and construct 22 stream crossings.

A public hearing will be held for this application on Tuesday, February 21, 2012 at 6:00 at the Country Village Conference Center located at 1101 North Road, Ishpeming, MI 49849.

The proposal will impact the following regulated areas:

Proposed Activities – County Road 595

- Excavate approximately 90,357 cubic yards of material from, and place approximately 291,808 cubic yards of fill within, approximately 25.45 acres of wetland.

- Of the wetland fill, a total of approximately 9,300 cubic yards will be placed below the 100-year floodplain elevation of the following streams: Middle Branch Escanaba River (3,746 cubic yards), Second River (2,084 cubic yards), Dead River (457 cubic yards), Mulligan Creek (1,667 cubic yards), and Yellow Dog River (1,346 cubic yards). Excavate a total of approximately 11,583 cubic yards of material from upland below the 100-year floodplain elevation of the following streams: Middle Branch Escanaba River 7,764 cubic yards), Dead River (2,357 cubic yards), and Yellow Dog River (1,462 cubic yards) to compensate for floodplain fill.

- Construct a temporary road and bridge crossing of the Second River by excavating approximately 1,530 cubic yards of material from, and placing approximately 4,860 cubic yards of fill and associated riprap within, 0.4 acres of wetland. Remove temporary bridge and associated approach fill and restore wetland to original grade following completion of the proposed permanent CR 595 bridge crossing of the Second River.

- Remove 53 existing culverts on streams and wetlands. Install 65 wetland equalization culverts. Install four upland drainage culverts with one end in wetland. Place a total of approximately 778 cubic yards of riprap in wetland at the ends of the 69 culverts.

- Place approximately 126 cubic yards of riprap to construct 42 riprap outfall structures and place approximately 300 cubic yards of riprap to construct 100 energy dissipation outfall structures for roadside storm water management.

Stream Crossing Summary:

- Remove three existing bridges (Dead River, Mulligan Creek, Yellow Dog River). Construct a total of 22 stream crossings of which three are clear-span bridges across streams/rivers (Middle Branch Escanaba River, Second River, and Yellow Dog River), two are Conspan® structures (Dead River and Mulligan Creek) and the remaining 17 are box culverts. Install one temporary bridge crossing at Second River. Place approximately 943 cubic yards of riprap, in total, at the 22 stream crossings.

- Reconstruct approximately 550 linear feet of streambed at 18 stream crossing locations by excavating, contouring and placing a total of approximately 367 cubic yards of bed material of varying sizes including fines, gravel, cobble, and boulder.

Stream Crossing Details:

- Station 122+75- Construct a new 60-foot span by 34-foot wide bridge with a 7.89-foot rise over the Middle Branch Escanaba River. Excavate approximately 50 cubic yards of material at the proposed bridge crossing to remove the remains of an old ford. Place approximately 112 cubic yards of heavy riprap. Impact 0.82 acres of wetland.

- Station 261+00- Replace two existing 36-inch diameter culverts and one 66-inch diameter culvert (each approximately 40 feet long) with a 58-foot span by 34-foot wide bridge with a 8.40-foot rise over the Second River. Reconstruct approximately 40 linear feet of streambed by excavating, contouring and placing a total of approximately 54 cubic yards of bed material of varying sizes including fines, gravel, cobble, and boulder. Place approximately 152 cubic yards of heavy riprap. Impact 0.78 acres of wetland.

- Station 262+00- Construct a temporary 50-foot span by 30-foot wide bridge immediately east of the proposed road on the Second River. Remove temporary bridge following completion of CR 595 over Second River. Place riprap as necessary. Impact 0.4 acres of wetland.

- Station 311+91- Replace two existing, approximately 42-foot long, 24-inch diameter culverts with a 73-foot long, 12-foot span by 5-foot rise box culvert at the Trembath Lake Outlet. Reconstruct approximately 80 linear feet of streambed by excavating, contouring and placing a total of approximately 18 cubic yards of bed material of varying sizes including fines, gravel, cobble, and boulder. Place approximately 23 cubic yards of riprap. Impact 0.17 acres of wetland.

- Station 426+47- Install a 103 foot long, 6-foot span by 4-foot rise box culvert at an unnamed stream. Reconstruct approximately 20 linear feet of streambed by excavating, contouring and placing a total of approximately 8.6 cubic yards of bed material of varying sizes including fines, gravel, cobble, and boulder. Place approximately 7.3 cubic yards of riprap. Impact 0.19 acres of wetland.

- Station 453+07- Install a 66-foot long, 12-foot span by 6-foot rise box culvert at Kipple Creek. Reconstruct approximately 30 linear feet of streambed by excavating, contouring and placing a total of approximately 17 cubic yards of bed material of varying sizes including fines, gravel, cobble, and boulder. Place approximately 7.3 cubic yards of riprap. Impact 0.11 acres of wetland.

- Station 491+08- Install a 112 foot long, 6-foot span by 4-foot rise box culvert at an unnamed tributary to Kipple Creek. Reconstruct approximately 25 linear feet of streambed by excavating, contouring and placing a total of approximately 20 cubic yards of bed material of varying sizes including fines, gravel, cobble, and boulder. Place approximately 19 cubic yards of riprap. Impact 0.54 acres of wetland.

- Station 517+10- Install a 101 foot long, 6-foot span by 4-foot rise box culvert at an unnamed tributary to Kipple Creek. Reconstruct approximately 30 linear feet of streambed by excavating, contouring and placing a total of approximately 20 cubic yards of bed material of varying sizes including fines, gravel, cobble, and boulder. Place approximately 19 cubic yards of riprap. Impact 0.42 acres of wetland.

- Station 1130+96- Replace an existing, approximately 25–foot long, 8-inch diameter culvert with a 47-foot long, 6-foot span by 4-foot rise box culvert at an unnamed tributary to Dishno Creek. Reconstruct approximately 50 linear feet of streambed by excavating, contouring and placing a total of approximately 30 cubic yards of bed material of varying sizes including fines, gravel, cobble, and boulder. Place approximately 33 cubic yards of riprap. Impact 0.19 acres of wetland.

- Station 1219+67- Install a 97-foot long, 6-foot span by 4-foot rise box culvert at an unnamed tributary to Voelkers Creek. Reconstruct approximately 20 linear feet of streambed by excavating, contouring and placing a total of approximately 11 cubic yards of bed material of varying sizes including fines, gravel, cobble, and boulder. Place approximately 13 cubic yards of riprap. Impact 0.23 acres of wetland.

- Station 1225+61- Replace an existing, approximately 30-foot long, 48-inch diameter culvert with a 61-foot long, 10-foot span by 5-foot rise box culvert at Voelkers Creek. Reconstruct approximately 40 linear feet of streambed by excavating, contouring and placing a total of approximately 35 cubic yards of bed material of varying sizes including fines, gravel, cobble, and boulder. Place approximately 64 cubic yards of riprap. Impact 0.19 acres of wetland.

- Station 1352+75- Replace an existing, 34-foot span by 13-foot wide timber bridge with a 68-foot long, 32-foot span by 10-foot rise Conspan® structure at the Dead River. Place approximately 66 cubic yards of heavy riprap. Impact 0.36 acres of wetland.

- Station 1404+15- Replace two existing, approximately 34-foot long, 36-inch diameter culverts with a 67-foot long, 7-foot span by 5-foot rise box culvert at Wildcat Canyon Creek. Reconstruct approximately 30 linear feet of streambed by excavating, contouring and placing a total of approximately 15 cubic yards of bed material of varying sizes including fines, gravel, cobble, and boulder. Place approximately 37 cubic yards of riprap. Impact 0.19 acres of wetland.

- Station 1418+67- Replace an existing, approximately 25-foot long, 30-inch diameter culvert with a 87-foot long, 6-foot span by 6-foot rise box culvert at Wildcat Canyon Creek. Reconstruct approximately 20 linear feet of streambed by excavating, contouring and placing a total of approximately 15 cubic yards of bed material of varying sizes including fines, gravel, cobble, and boulder. Place approximately 17 cubic yards of riprap. Impact 0.21 acres of wetland.

- Station 1423+13- Replace an existing, approximately 34-foot long, 24-inch diameter culvert with a 79-foot long, 6-foot span by 4-foot rise box culvert at an unnamed tributary to Wildcat Canyon Creek. Reconstruct approximately 20 linear feet of streambed by excavating, contouring and placing a total of approximately 18 cubic yards of bed material of varying sizes including fines, gravel, cobble, and boulder. Place approximately 14 cubic yards of riprap. Impact 0.49 acres of wetland.

- Station 1430+13- Replace an existing, approximately 30-foot long, 24-inch diameter culvert with a 107-foot long, 8-foot span by 6-foot rise box culvert at Wildcat Canyon Creek. Reconstruct approximately 25 linear feet of streambed by excavating, contouring and placing a total of approximately 17 cubic yards of bed material of varying sizes including fines, gravel, cobble, and boulder. Place approximately 47.5 cubic yards of riprap. Impact 0.11 acres of wetland.

- Station 1506+70- Replace existing, approximately 32-foot long, 24-inch and 36-inch diameter culverts with a 77-foot long, 10-foot span by 6-foot rise box culvert at an unnamed tributary to Mulligan Creek. Reconstruct approximately 20 linear feet of streambed by excavating, contouring and placing a total of approximately 14 cubic yards of bed material of varying sizes including fines, gravel, cobble, and boulder. Place approximately 63 cubic yards of riprap. Impact 0.03 acres of wetland.

- Station 1513+27- Replace an existing, approximately 32-foot long, 36-inch diameter culvert with a 70-foot long, 6-foot span by 4-foot rise box culvert at an unnamed tributary to Mulligan Creek. Reconstruct approximately 20 linear feet of streambed by excavating, contouring and placing a total of approximately 7 cubic yards of bed material of varying sizes including fines, gravel, cobble, and boulder. Place approximately 34 cubic yards of riprap. Impact 0.29 acres of wetland.

- Station 1522+93- Replace an existing, approximately 25-foot long, 6-inch diameter culvert with a 113-foot long, 5-foot span by 3-foot rise box culvert at an unnamed tributary to Mulligan Creek. Reconstruct approximately 25 linear feet of streambed by excavating, contouring and placing a total of approximately 19 cubic yards of bed material of varying sizes including fines, gravel, cobble, and boulder. Place approximately 10 cubic yards of riprap. Impact 0.06 acres of wetland.

- Station 1527+21- Replace an existing, buried culvert (size unknown) with a 98-foot long, 4-foot span by 3-foot rise box culvert at an unnamed tributary to Mulligan Creek. Reconstruct approximately 35 linear feet of streambed by excavating, contouring and placing a total of approximately 31 cubic yards of bed material of varying sizes including fines, gravel, cobble, and boulder. Place approximately 8 cubic yards of riprap. Impact 0.09 acres of wetland.

- Station 1556+82- Install a 77-foot long, 4-foot span by 3-foot rise box culvert at an unnamed tributary to Mulligan Creek. Reconstruct approximately 20 linear feet of streambed by excavating, contouring and placing a total of approximately 16 cubic yards of bed material of varying sizes including fines, gravel, cobble, and boulder. Place approximately 8 cubic yards of riprap. Impact 0.10 acres of wetland.

- Station 1565+25- Replace an existing, approximately 30-foot span by 12-foot wide timber bridge with a 54-foot long, 36-foot span by 11-foot rise Conspan® structure at Mulligan Creek. Place approximately 92 cubic yards of heavy riprap. Impact 0.39 acres of wetland.

- Station 1715+00- Replace an existing 24-foot span by 12-foot wide steel-beam bridge with a 55-foot span by 34-foot wide bridge with a 9.80-foot rise over at the Yellow Dog River. Remove approximately 360 cubic yards of existing abutment fill. Place approximately 97 cubic yards of heavy riprap. Impact 0.60 acres of wetland.

Proposed Activities – Stream Mitigation Measures

Stream mitigation consists of the following measures

- Many of the existing streams crossing structures are undersized. These are being replaced by properly sized structures that will match at a minimum bankfull conditions.

- Along the East Branch Salmon Trout River remove three existing approximately 30-foot long, 36 to 48-inch diameter culverts. Reconstruct approximately 90 linear feet of streambed at these locations by excavating, contouring and placing a total of approximately 53 cubic yards of bed material of varying sizes including fines, gravel, cobble, and boulder. These structures will be replaced at station 29+74 with a 65-foot span by 34-foot wide bridge. Place approximately 125 cubic yards of heavy riprap. The work in the Salmon Trout River includes the excavation of approximately 41 cubic yards of material from, and placement of approximately 73 cubic yards of fill within, 0.01 acres of wetland.

Proposed Activities – Wetland Mitigation

- Create a total of 49.4 acres of new wetland to mitigate for the approximately 25.81 acres of wetland resource impacts associated with this project: CR 595 (25.36 acres), plus the stream mitigation measures on the East Branch Salmon Trout River (0.01 acres), and the Trail 5 Relocation (0.35 acres). A permit for Trail 5 Relocation resource impacts will be applied for by others, however, the proposed impacts are being mitigated for in this permit application. The wetland impacts consist of 5.83 acres of emergent, 0.6 acres of scrub-shrub and 19.38 acres of forested wetland. The proposed mitigation consists of approximately 8.7 acres of emergent, 1 acre of scrub-shrub and 39.7 acres of forested wetland to be constructed at five wetland mitigation sites.

- Restore approximately 3.53 acres of wetland at 26 locations by removing existing roads and trails where these features will no longer be used due to the CR 595 road alignment.

The project is located in T48N, R29W, Sections 1,12,25,26,35 & 36, T49N,R28W, Section 31, T49N, R29W, Sections 2,11,14,23,25,26 & 36, T50N, R28W Sections 4,10 & 18, Champion Township; T48N, R28W, Sections 7,8,18,19 & 30, Ely Township; T47N, R29W, Section 2 , Humboldt Township; T50N, R29W Sections 13,23,24,26 & 35, Michigamme Township; Marquette County, Michigan, in accordance with plans attached to this notice.

Due to the size of this application, all of the submitted materials are not included in this public notice. To view or receive a copy of the entire application please call or write the District office at the address and phone number indicated at the top of this public notice.

THIS NOTICE IS NOT A PERMIT

The proposed project may also be regulated by one or more additional parts of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA) that are administered by the Water Resources Division (WRD). The requirements of all applicable parts are considered in determining if it is in the public interest to issue a permit.

When a permit application is received requesting authorization to work in or over the inland waters of the State of Michigan, pursuant to Part 301, Inland Lakes and Streams, of the NREPA, the NREPA provides that the department submit copies for review to the department of public health, the city, village or township, and the county where the project is to be located, the local soil conservation district, any local watershed council organized under Part 311, Local River Management, and the local port commission. Additional notification is provided to certain persons as required by statute or determined by the department.

Those persons wanting to make comments on the proposed project shall furnish this office with their written comments no later than 20 days from the date of this notice. Written comments will be made part of the record and should reference the above file number. Objections must be factual, specific, and fully describe the reasons upon which any objection is founded. Unless a written request is filed with the department within the 20-day public comment period, the department may make a decision on the application without a public hearing. The determination as to whether a permit will be issued or a public hearing held will be based on evaluation of all relevant factors defined in Sections 30106 and 30311, or permit criteria defined by other appropriate parts of the NREPA. These Sections address the effect of the proposed work on the public trust or interest including navigation, fish, wildlife, and water quality among other criteria. Public comments received will also be considered.

cc: Jim Iwanicki, Marquette CRC, applicant
Bob Doepker, DNR, Wildlife
Marquette County Clerk
Champion Township Clerk
Michigamme Township Clerk
Jean Battle, USACE-Marquette
Melanie Havemen, USEPA
Chris Mensing, USFWS
Steve Casey, DEQ, WRD
Ginny Pennala, DEQ-WRD
Colleen Okeefe, DEQ- WRD
Todd Losee, DEQ-WRD
George Madison, DNR, Fisheries,
Marquette County Health Department
Ely Township Clerk
Humboldt Township Clerk
Marquette County Drain Commissioner
Marquette Conservation District
USACE
Jeff King, King & McGregor
Mike Smolinski, DEQ,WRD
Sue Conradson, DEQ-WRD
Bill Larsen, DEQ-WRD
Adjacent Property Owners
Pauline Knapp-Spruce, Keweenaw Bay Indian Community

U.S. Army Corps of Engineers www.lre.usace.army.mil

RECEIVED
MICH. DEPT. OF NATURAL RESOURCES & ENVIRONMENT

Michigan Department of Environmental Quality www.mi.gov/jointpermit DEQ

AGENCY USE	Previous USACE File Number	Date Received	DEQ File Number
	USACE File Number	JAN 17 2012 WATER RESOURCES DIVISION	11-52-0075-P
			Fee received $

Validate that all parts of this checklist are submitted with the application package. Fill out application and additional pages as needed.

☒ All items in Sections 1 through 9 are completed.
☒ Project-specific Sections 10 through 20 are completed.
☒ Dimensions, volumes, and calculations are provided for all impact areas.
☒ All information contained in the headings for the appropriate Sections (1-20) are addressed, and identified attachments (➡) are included.
☒ Map, site plan(s), cross sections; one set must be black and white on 8 ½ by 11 inch paper; photographs.
☐ Application fee is attached.

1 Project Location Information *For Latitude, Longitude, and TRS info anywhere in Michigan see www.mcgi.state.mi.us/wetlands/*

Project Address (road, if no street address)	Zip Code	Municipality (Township/Village/City)	County
US Hwy 41 to Triple A Road		Champion, Ely, Michigamme, Humboldt	Marquette
Property Tax Identification Number(s)	Latitude		Township/Range/Section (TRS)
	see attachment N		T _____ N or S; R _____ E or W;
Subdivision/Plat and Lot Number	Longitude		Sec see attachment
	- see. attachment W		OR Private Claim #

2 Applicant and Agent Information

Owner/Applicant (individual or corporate name)	Agent/Contractor (firm name and contact person)
Marquette County Road Commission Attn: Jim Iwanicki	King & MacGregor Environmental, Inc. Attn: Jeff King
Mailing Address 1610 N. Second Street	Mailing Address 2520 Woodmeadow Drive SE
City Ishpeming State MI Zip Code 49849	City Grand Rapids State MI Zip Code 49546
Contact Phone Number 906-486-4491 Fax 906-486-4493	Contact Phone Number 616-957-1231 Fax 616-957-2198
Email jiwanicki@marqroad.org	E-mail jking@king-macgregor.com

☒ No ☐ Yes Is the applicant the sole owner of all property on which this project is to be constructed and all property involved or impacted by this project? ➡ If no, attach letter(s) of authorization from all property owners including the owner of the disposal site.

Property Owner's Name (If different from applicant)	Mailing Address
All property owners are listed in Section 8	
Contact Phone Number	City State Zip Code

3 Project Description

Project Name CR595	Preapplication File Number 07 - 52 - 5005 -P
Name of Water body see attachment	Date project staked/flagged Fall 2010

The proposed project is on, within, or involves (check all that apply)

☐ an inland lake (5 acres or more)
☐ a pond (less than 5 acres)
☒ a stream, river, ditch or drain
☐ a legally established County Drain
Date Drain was established
☐ a channel/canal
☒ 500 feet of an existing water body
☐ a Great Lake or Section 10 Waters
☒ a wetland
☒ a 100-year floodplain
☐ a dam
☐ a designated high risk erosion area
☐ a designated critical dune area
☐ a designated environmental area

Project Use
☐ private
☐ commercial
☒ public/government
☐ project is receiving federal/state transportation funds
☐ WRP
☐ other

Indicate the type of permit being applied for: ☐ General Permit ☐ Minor Project ☒ Individual (All other projects.) ➡ See Appendix C.

Written Summary of All Proposed Activities
e attachment

Construction Sequence and Methods

Project to be constructed in phases. Stake limits of disturbance and clear site. Begin grading (cut & fill). Remove existing culverts and bridges nd install new culverts and bridges. Complete site grading. Remove abandoned sections of road and driveways. Conduct wetland restoration cavation. Complete wetland mitigation construction.

4 Project Purpose, Use and Alternatives *Attach additional sheets as necessary.*

Describe the purpose of the project and its intended use; include any new development or expansion of an existing land use.

The purpose of the proposed CR 595 project is to construct a primary county north-south road that (1) connects and improves emergency, commercial and recreational access to a somewhat isolated but key industrial, commercial and recreational area in northwest Marquette County to US-41, and (2) reduces truck travel from this area through the County's population centers.

Describe the alternatives considered to avoid or minimize resource impacts. Include factors such as, but to limited to, alternative locations, project layout and design, and construction technologies. For utility crossings include alternative routes and construction methods.

Several alternatives were considered. See attached Alternatives Analysis and Project Assessment document for details.

5 Locating Your Project Site *Attach a legible black and white map with a North arrow.*

Names of roads of closest intersection US 41 and County Road FY

Directions from main intersection to the project site, with distances from the best and nearest visible landmark and water body The south end of the proposed road begins at US 41 at County Road FY winding approximately 21.4 miles north to Triple A Road.

Description of buildings on the site *(color; 1 or 2 story, other)*	Description of adjacent landmarks or buildings *(address; color; etc)*
n/a	n/a

How can your site be identified if there is no visible address? Project location maps attached.

6 Easements and Other Permits

☒ No ☐ Yes Is there a conservation easement or other easement, deed restriction, lease, or other encumbrance upon the property?

➡ If yes, attach a copy. Provide copies of court orders and legal lake levels if applicable.

List all other federal, interstate, state, or local agency authorizations including required assurances for Critical Dune Area projects.

Agency	Type of Approval	Number	Date Applied	Date approved /denied	Reason for denial
MCCD	SESC			RECEIVED MICH. DEPT. OF NATURAL RESOURCES & ENVIRONMENT JAN 17 2012 WATER RESOURCES DIVISION	
MCRC	Transportation Plan				
MDOT	Permit to Connect (CR595 to US 41)				

7 Compliance

If a permit is issued, when will the activity begin? (M/D/Y) ASAP	Proposed completion date (M/D/Y) 5 yrs after permit issuance

☒ No ☐ Yes Has any construction activity commenced or been completed in a regulated area?

➡ If Yes, identify the portion(s) underway or completed on drawings or attach project specifications and give completion date(s).

☐ No ☐ Yes Were the regulated activities conducted under a DEQ and/or USACE permit?

➡ If Yes, list the permit numbers

☒ No ☐ Yes Are you aware of any unresolved violations of environmental law or litigation involving the property?

➡ If Yes, attach explanation.

8 Adjacent Property Owners *Provide current mailing addresses. Attach additional sheets/labels for long lists.*

☐ Established Lake Board ☐ Lake Association	Contact Person	Mailing Address	City	State and Zip Code

List all adjacents. If you own the adjacent lot, provide the requested information for the first adjacent parcel that is not owned by you.

Property Owner's Name	Mailing Address	City	State and Zip Code
* Plum Creek Timberlands, LP	2500 Daniels Bridge Rd, Ste 2A Bldg 200	Athens	GA 30606
GMO Renewable Resources LLC	45815 Highway M-26	Atlantic Mine	MI 49905
ngyear Realty Corporation	210 N. Front Street	Marquette	MI 49855
* Kennecott Eagle Minerals Co.	504 Spruce Street	Ishpeming	MI 49849
Callahan Mining Corp.	PO Box 1	Coeur D'Alene	ID 83816
WE Energies	231 W. Michigan, RmA-252	Milwaukee	WI 53201
O'Dovero Properties	110 Airport Road	Negaunee	MI 49866

Michigan Department of Natural Resources	410 W. M-35	Gwinn	MI 49841
* Humboldt Wetlands Preserve	560 Mather Avenue	Ishpeming	MI 49849
A. Lindberg & Sons	560 Mather Avenue	Ishpeming	MI 49849
Christopher & Denise Andrews	3563 Brunswick Road	Holton	MI 49425
Gary & Lynn Laitala	15180 U.S. 41	Champion	MI 49814
James & Vivian Penrose/Vivian Penrose Trust	1320 CR PPO	Ishpeming	MI 49849
Michael & Wendy Rautio	814 Wabash Street	Ishpeming	MI 49849
Pamela Sue Solka	313 N. Brown Avenue	Negaunee	MI 49866
Joseph Wasie	4372 County Road FX	Champion	MI 49814
Jaak & Patricia Liivoja	830 E. North Street	Ishpeming	MI 49849
Linda Johnson	110 - 9th Street	Salmon	ID 83453
Dennis & Judy Kangas	1600 S. Westwood Circle	Ishpeming	MI 49849
Robert McQuestion	14355 - 135th Avenue	Leroy	MI 49655
L. S. & I. Railroad	345 - M-35	Negaunee	MI 49866
Landowners Near Proposed CR595			
Mudjekewis LLC	221 Lakewood Lane	Marquette	MI 49855
David Wasie	4372 County Road FX	Champion	MI 49814
Brian Hughes et al	W8126 N5.5 Lane	Wallace	MI 49893
Steven & Annette Johnson	1828 S. Raisinville	Monroe	MI 48161
Stream Mitigation - East Branch Salmon Trout			
Robert McQuestion	see above	see above	see above
Longyear Realty Corporation	see above	see above	see above
Royden & Clare Magee	2373 W. Fair Avenue	Marquette	MI 49855
Dean Kananen	1225 W. Washington Street	Marquette	MI 49855
JML Heirs LLC c/o Longyear Realty	210 N. Front Street	Marquette	MI 49855
Christopher Sutter	19 S. York Street	Fox Lake	IL 60020
* = Also Wetland Mitigation Site Property Owners			

RECEIVED
MICH. DEPT. OF NATURAL RESOURCES & ENVIRONMENT
JAN 17 2012
WATER RESOURCES DIVISION

9 Applicant's Certification *Read carefully before signing.*

I am applying for a permit(s) to authorize the activities described herein. I certify that I am familiar with the information contained in this application; that it is true and accurate; and, to the best of my knowledge, that it is in compliance with the State Coastal Zone Management Program. I understand that there are penalties for submitting false information and that any permit issued pursuant to this application may be revoked if information on this application is untrue. I certify that I have the authority to undertake the activities proposed in this application. By signing this application, I agree to allow representatives of the DEQ, USACE, and/or their agents or contractors to enter upon said property in order to inspect the proposed activity site before and during construction and after the completion of the project. I understand that I must obtain all other necessary local, county, state, or federal permits and that the granting of other permits by local, county, state, or federal agencies does not release me from the requirements of obtaining the permit requested herein before commencing the activity. I understand that the payment of the application fee does not guarantee the issuance of a permit.

	Printed Name	Signature	Date
☐ Property Owner ☐ Agent/Contractor ☒ Corp. or Public Agency / Title	James M. Iwanicki, PE Engineer-Manager Marquette County Road Comm.	James M Iwanicki	10/4/11

10 Projects Impacting Inland Lakes, Streams, Great Lakes, Wetlands or Floodplains

- Complete only those sections A through M applicable to your project.
- If your project impacts wetlands also complete Section 12. If your project impacts regulated floodplains also complete Section 13.
- To calculate volume in cubic yards (cu yd), multiply the average length in feet (ft) times the average width (ft) times the average depth (ft) and divide by 27. Example: (25 ft long x 10 ft wide x 2 feet deep) / 27 = 18.5 cubic yards
- Some projects on the Great Lakes require an application for conveyance prior to Joint Permit Application completeness.

➧ Provide a black and white overall site plan, with cross-section and profile drawings. Show existing lakes, streams, wetlands, and other water features; existing structures; and the location of all proposed structures, land change activities and soil erosion and sedimentation control measures. Review Appendix B and EZ Guides for aid in providing complete site-specific drawings.

➡Provide tables for multiple impact areas or multiple activities such as multiple fill areas or multiple culverts. Include your calculations.

Water Level Elevation

On inland waters ☐ NGVD 29 ☒ NAVD 88 ☐ other Observed water elevation (ft) date of observation (M/D/Y)

On a Great Lake ☐ IGLD 85 ☐ surveyed ☐ converted from observed still water elevation.

☒ **A. PROJECTS REQUIRING FILL** (See All Sample Drawings)

➡Attach a site plan and cross-section views to scale showing maximum and average fill dimensions with calculations.

➡ For multiple impact areas on a site provide a table with location, dimensions and volumes for each fill area.

Purpose ☐ bioengineered shore protection ☐ boat ramp ☐ boat well ☒ bridge or culvert ☐ crib dock ☐ riprap ☐ seawall ☐ swim area ☒ other CR 595

Dimensions of fill (ft) Length Width Maximum Depth	Total volume (cubic yards) 291,808	Volume below OHWM (cubic yards) @ stream crossings
Maximum water depth in fill area (ft)	Area filled (sq ft) 1,108,740	Will filter fabric be used under proposed fill? ☒ No ☐ Yes (If Yes, type)

Fill will extend feet into the water from the shoreline and upland feet out of the water.

RECEIVED
MI DEPT. OF NATURAL RESOURCES & ENV
JAN 17 2012
WATER RESOURCES DIVIS

Type of clean fill ☐ peastone % ☒ sand % ☒ gravel % ☒ other blasted rock

Source of clean fill ☒ commercial ☒ on-site ➡ If on-site, show location on site plan. ☐ other ➡ If other, attach description of location.

B. PROJECTS REQUIRING DREDGING OR EXCAVATION (See Sample Drawings)

Refer to www.mi.gov/jointpermit for spoils disposal and authorization requirements.

➡Attach a site plan and cross-section views to scale showing maximum and average dredge or excavation dimensions with calculations.

➡For multiple impact areas on a site provide a table with location, dimensions and volumes for each dredge/excavation area.

Purpose ☐ boat ramp ☐ boat well ☒ bridge or culvert ☐ maintenance dredge ☐ navigation ☐ pond/basin ☒ other CR 595 peat/muck removal below roadbed

Dimensions (ft) Length Width Maximum Depth	Total volume (cu yds) 90,357	Volume below OHWM (cu yds) @ stream crossings

Has this same area been previously dredged?	☒ No ☐ Yes	If Yes, provide date and permit number:
Will the previously dredged area be enlarged?	☒ No ☐ Yes	If Yes, when and how much?
Is long-term maintenance dredging planned?	☒ No ☐ Yes	If Yes, how often?

Dredge or Excavation Method ☐ Hydraulic ☒ Mechanical ☐ other

Spoils Disposal

Dredged or excavated spoils will be placed ☒ on-site ☐ landfill ☐ USACE confined disposal facility ☐ other upland off-site

For disposal, provide a ➡Detailed spoils disposal area location map and site plan with property lines.

➡Letter of authorization from property owner of spoils disposal site, if disposed off-site.

For volumes less than 5,000 cu yards, has proposed dredge material been tested for contaminants within the past 10 years?

☐ No ☐ Yes ➡If Yes, provide test results with a map of sampling locations.

☒ **C. PROJECTS REQUIRING RIPRAP** (See Sample Drawings 2, 3, 8, 12, 14, 22, and 23)

Riprap water ward of the ordinary high water mark: dimensions (ft) length width depth	Volume(cu yd) 1,068
Riprap landward of the ordinary high water mark: dimensions (ft) length width depth	Volume(cu yd) 778

›e and size of riprap (inches)	Will filter fabric or pea stone be used under proposed riprap?
☐ field stone ☒ angular rock ☐ other	☐ No ☒ Yes, Type geotextile, nonwoven

12 ACTIVITIES THAT MAY IMPACT WETLANDS (See Sample Drawings 8 & 9). Complete other Sections as applicable.

- Locate your site and wetland information with the DEQ Wetlands Map Viewer at www.mcgi.state.mi.us/wetlands/

For information on the DEQ's Wetland Identification Program (WIP) visit www.mi.gov/wetlands.

➡Provide a detailed site plan with labeled property lines, upland and wetland areas, and dimensions and volumes of wetland impacts.

➡Complete the wetland dredge and wetland fill dimension information below for each impacted wetland area.

➡Attach tables for multiple impact areas or activities.

➡Attach at least one cross-section for each wetland dredge and/or fill area; show wetland and upland boundaries on the cross-section.

Has the DEQ conducted a wetland assessment for this parcel?	☒ No ☐ Yes	➡ If Yes, provide a copy or WIP number:
Has a professional wetland delineation been conducted for this parcel?	☐ No ☒ Yes	➡ If Yes, provide a copy with data sheets
Is there a recorded DEQ easement on the property?	☒ No ☐ Yes	➡ If Yes, provide the easement number
Did the applicant purchase the property before October 1, 1980?	☒ No ☐ Yes	➡ If Yes, provide documentation.
Is any grading or mechanized land clearing proposed?	☐ No ☒ Yes	➡ If Yes, label the locations on the site plan.
Has any of the proposed grading or mechanized land clearing been completed?	☒ No ☐ Yes	➡ If Yes, label the locations on the site plan

Proposed Activity			
	☐ boardwalk or deck (Section 10I)	☒ bridges and culverts (Section 14)	☐ designated environmental area
	☐ dewatering	☐ draining surface water	☒ driveway / road
	☐ fences (Section 10L)	☒ fill or dredge	☒ restoration
	☐ septic system	☒ stormwater discharge (Section 10J)	☐ other

	Dimensions	Area	Average depth (ft)	Volume (cu yd)
FILL	maximum length (ft) See attached Wetland Impacts spreadsheet & Wetland Cross Section Summary maximum width (ft) for further details	☒ acres ☐ sq ft 25.45		291,808
DREDGE	maximum length (ft) ee attached Wetland Impacts Spreadsheet & Wetland Cross Section Summary maximum width (ft) for further details	☒ acres ☐ sq ft 25.45		90,357

RECEIVED
MI DEPT. OF NATURAL RESOURCES & ENVIRONMENT
JAN 17 2012
WATER RESOURCES DIVISION

Spoils Disposal

Dredged or excavated spoils will be placed ☒ on-site ☐ landfill ☐ USACE confined disposal facility ☐ other upland off-site

For disposal, provide a ➡ Detailed spoils disposal area location map and site plan with property lines.

➡ Letter of authorization from property owner of spoils disposal site, if disposed off-site.

Septic System

The proposed project will be serviced by:
☐ public sewer ☐ private septic system
➡ Show system on plans.

If a private septic system is proposed, has an application for a permit been made to the County Health Department? ☐ No ☐Yes
If Yes, has a permit been issued? ☐ No ☐ Yes ➡ Provide a copy of the permit.

Describe the wetland impacts, the proposed use or development, and the alternatives considered:
See attached "Proposed Activities" and "Alternatives Evaluated for the Proposed Project".

Does the project impact more than 1/3 acre of wetland? ☐ No ☒ Yes
➡ If Yes, submit a Mitigation Plan with the type and amount of mitigation proposed. For more information go to www.mi.gov/wetlands

Describe how impacts to waters of the United States will be avoided and minimized:
n/a

Describe how the impact to waters of the United States will be compensated. OR Explain why compensatory mitigation should not be required for the proposed impacts.
n/a

FLOODPLAIN ACTIVITIES (See Sample Drawing 5 and others. Complete other applicable sections.)

- For more information go to www.mi.gov/floodplainmanagement. This site also lists the projects and requirements for an expedited floodplain review under "Expedited Review Information for Minor Floodplain Projects."
- Examples of projects proposed within the non-floodway portions of the 100-year-floodplain which may qualify for an expedited review: Open pile decks and boardwalks; residences, commercial/industrial facilities, garages and accessory structures; parking lots; pavilions, gazebos, large community playground structures; residential swimming pools
- Examples of projects proposed within the floodway portions of the floodplain which may qualify for an expedited review: Open pile decks and boardwalks, (non-enclosed) that are anchored to prevent floatation and that do not extend over the bed and bank of a watercourse; parking lots constructed at grade or resurfacing that is no more than 4 inches above the existing grade; dry hydrants that do not require fill placement; scientific structure such as staff gauges, water monitoring devices, water quality testing devices, and core sampling devices which meet specific design criteria and fish structures that meet specific design criteria.
- For expedited review include:
  - ➡ Photographs of the work site labeled to identify what is being shown and with the direction of the photo clearly indicated. Include photographs of any river or stream adjacent to the project.
  - ➡ A letter or statement from the local unit of government acknowledging your proposed application. See the website for sample wording.
- A hydraulic analysis or hydrologic analysis may be required to fully assess floodplain impacts.
- The state building code requires an Elevation Certificate for any building construction or addition in a floodplain. A sample form can be found at www.fema.gov/nfip/elvinst.shtm.
  - ➡Attach additional sheets or tables for multiple proposed floodplain activities and provide hydraulic calculations.
  - ➡Show reference datum used on plans.

Proposed Activity ☒ fill ☒ excavation or cut ☐ other	100-year floodplain elevation (ft) (if known) See Floodplain Activities spreadsheet for further details Datum ☐ NGVD 29 ☒ NAVD 88 ☐ other
Site is feet above ☐ ordinary high water mark (OHWM) OR ☐ observed water level. Date of observation (M/D/Y)	
Fill volume below the 100-year floodplain elevation (cu yds) 9,300	Compensating cut volume below the 100-year floodplain elevation (cu yds) 11,583

Buildings and/or Additions

Type of construction is ☐ residential ☐ garage/pole barn ☐ non residential ☒ other county road

Construction is ☐ new ☐ addition AND Serviced by ☐ public sewer ☐ private septic ☐ other

RECEIVED
MICH. DEPT. OF NATURAL RESOURCES & ENVIRONMENT
JAN 17 2012
WATER RESOURCES DIVISION

Lowest adjacent grade (ft): existing proposed
datum ☐ NGVD 29 ☐ NAVD 88 ☐ other

Existing Structure Information		Proposed Structure Information	
Foundation type	☐ basement	Foundation type	☐ basement
☐ concrete slab on grade	☐ pilings	☐ concrete slab on grade	☐ pilings
☐ crawl space	☐ other	☐ crawl space	☐ other
Foundation floor elevation (ft)		Foundation floor elevation (ft)	
Height of crawl space/basement from finished foundation floor to bottom of floor joists (ft)		Height of crawl space/basement from finished foundation floor to bottom of floor joists (ft)	
Elevation of 1st floor above basement floor/crawl space (ft)		Elevation of 1st floor above basement floor/crawl space (ft)	

For enclosed areas below the flood elevation, such as a crawl space, garages and accessory structures:

Area of proposed foundation (sq ft)

Elevation of proposed enclosed area (ft) datum ☐ NGVD 29 ☐ NAVD 88 ☐ other

Number of flood vents net opening of each vent (sq inches) lowest elevation of flood vents (ft)

14 BRIDGES and CULVERTS Including Foot and Cart Bridges. (See EZ Guides and Sample Drawings 5, 14A, 14B, 14C, 14D.)

- Complete other applicable Sections, including 10A-C.
  A hydraulic analysis or hydrologic analysis may be required to fully assess impacts. ➡Attach hydraulic calculations.
- High Water Elevation - describe reference point and highest known water level above or below reference point and date of observation.
  ➡Attach additional sheets for multiple bridges and/or culverts.
  ➡Provide detailed site-specific drawings of existing and proposed Plan and Elevation View at a scale adequate for detailed review.
  ➡Provide all information in the boxes below; do not write in a reference to plan sheets. Show reference datum used on plans.

Stream Information

The site has a high water elevation (ft) ☐ above or ☐ below the Reference Point of Date observed	
Reference datum used ☐ NGVD 29 ☒ NAVD 88 ☐ IGLD 85 (Great Lakes coastal areas) ☐ other	
Average stream width (ft) at the ordinary high water mark (OHWM) outside the influence of any ponding or scour holes around the structure — Upstream	
Average stream width (ft) at the ordinary high water mark (OHWM) outside the influence of any ponding or scour holes around the structure — Downstream	
Cross-sectional area of primary channel (sq ft) (See Sample Drawing 14C for more information)	
The width of the stream where the water begins to overflow its banks. Bankfull width (ft)	
The invert of the stream 100-feet from structure (ft) — Upstream	
The invert of the stream 100-feet from structure (ft) — Downstream	
Is the existing culvert perched? ☐ No ☐ Yes If Yes, provide a profile of the channel bottom at the high and low points for a distance of 200 feet upstream and downstream of the culvert.	

Complete this form for each bridge / culvert location.		Existing	Proposed
Bridge Number of bridge spans		Spreadsheets	Attached:
Bridge type (concrete box beam, concrete I-beam, timber, etc.)		Stream Crossing	Schedule
Bridge span (length perpendicular to stream) (ft)		Wetland Equal.	Culverts Sched.
Bridge width (parallel to stream) (ft)		Upl Drainage/	Wetland Culvert Schedule
Bottom of bridge beam (ft)	Upstream		
	Downstream		
Stream invert elevation at bridge (ft)	Upstream		
	Downstream		
Bridge rise from bottom of beam to streambed (ft)			
Culvert Number of culverts			65
Culvert type (arch, bottomless, box, circular, elliptical, etc.)			
Culvert material (concrete, corrugated metal, plastic, etc.)			
Culvert length (ft)			
Culvert ☐ width ☐ diameter (ft)			
Culvert height prior to any burying (ft)			
Depth culvert will be buried (ft)			
Elevation of culvert crown (ft)	Upstream		
	Downstream		
Higher elevation of ☐ culvert invert OR ☐ streambed within culvert (ft)	Upstream		
	Downstream		
Complete for both Bridges and Culverts Entrance design (mitered, projecting, wingwalls, etc.)			
Total structure waterway opening above streambed (sq ft)			
Total structure waterway area below the 100-year elevation (sq ft) (if known)			
Elevation of road grade at structure (ft)			
Elevation of low point in road (ft)			
Distance from low point of road to mid-point of bridge crossing (ft)			
Length of approach fill from edge of bridge/culvert to existing grade (ft)			

A Licensed Professional Engineer may certify that your project will not cause a harmful interference for a range of flood discharges up to and including the 100-year flood discharge. The "Required Certification Language" is found under "forms" on the "maps, forms and documents" link from the www.mi.gov/jointpermit page or a copy may be requested by phone, email, or mail. A hydraulic report supporting this certification may also be required.
Is Certification Language attached? ☐ No ☐ Yes

Coincidental Road Table
11-4-11

Approximate Starting Point	Approximate Ending Point	Approximate length (in miles) of the proposed CR 595 centerline within 50 feet of "vehicle accessible" roads/trails	Approximate length (in miles) of the proposed CR 595 centerline within 50 feet of ATV, snowmobile and/or hiking-accessible trails	Approximate length (in miles) of the proposed CR 595 centerline **NOT** within 50 feet of "vehicle accessible" roads/trails	Approximate length (in miles) of the proposed CR 595 centerline **NOT** within 50 feet of ATV, snowmobile and hiking-accessible trails	Total
U.S. 41	1518+00	7.0		9.8		***16.8***
1518+00	1675+00		0.5		2.5	***3.0***
1675+00	Triple A Road	0.9		0.7		***1.6***
	Total	***7.9***	***0.5***	***10.5***	***2.5***	***21.4***

MDEQ Permit Application
CR 595 - Marquette County Road Commission
MDEQ File No. 11-52-0075-P

TABLE OF CONTENTS

Found on CD - Folder 18
Alternatives Analysis & Project Assessment

LIST OF APPENDICES

Appendix A

Marquette County Board of Commissioners Letter to Marquette County Road Commission. October 4 2010

Marquette County Road Commission Meeting Minutes. October 7, 2010

Marquette County Road Commission Meeting Minutes. October 18, 2010

Marquette County Road Commission Resolution. October 18, 2010

Marquette County Road Commission Meeting Minutes. September 19, 2011

Appendix B

Bureau of Transportation Planning Worksheet National Functional Classification (NFC) Part 1: Basic Data Worksheet: Request to Revise NFC

Bureau of Transportation Planning Worksheet National Functional Classification (NFC) Part 2: Justification Worksheet: Request to Revise NFC

Bureau of Transportation Planning Worksheet National Functional Classification (NFC) Part 2: Justification Worksheet: Request to Revise NFC (MCRC Completed October 28, 2010)

CR 595 Maps

E-Mail Correspondence between Susan Berquist/Jim Iwanicki. October 19 thru October 28, 2010

E-Mail Correspondence from Michigan Department of Transportation to Marquette County Road Commission. September 27, 2011

Federal Highway Administration Functional Classification Guidelines

Marquette County Road Commission Letter to MDOT Requesting MDOT Commit to Placing CR 595 On the Primary Road System. October 28, 2010

Memo to Marquette County Road Commissioners from Iwanicki Recommending CR 595. October 19, 2010

Michigan Department of Transportation Instructions & Forms for Preparing: Annual Road Mileage Certification for Counties

Michigan Department of Transportation Letter Regarding Primary County Road Certification for CR 595. November 18, 2010

Michigan Department of Transportation Letter Regarding Federal Highway Administration Approval. January 11, 2011

Michigan Department of Transportation Letter Regarding Support to the Marquette County Road Commission. June 2, 2011

Appendix C

Typical AASHTO Sections for Primary County Roads

RECEIVED
MICH. DEPT. OF NATURAL RESOURCES & ENVIRONMENT
JAN 17 2012
WATER RESOURCES DIVISION

Permit Application Section 1 – Project Location Information

Township Names & Township/Range/Section

CR 595

Michigamme Township	T50N, R29W, Sections 13, 23, 24, 26 & 35
Champion Township	T50N, R28W, Section 18
	T49N, R29W, Sections 2, 11, 14, 23, 25, 26 & 36
	T48N, R29W, Sections 1, 12, 25, 35 & 36
Ely Township	T48N, R28W, Sections 7, 18, 19, & 30
Humboldt Township	T47N, R29W, Section 2

Stream Mitigation- East Branch Salmon Trout

Champion Township	T50N, R28W, Sections 4 & 10

Wetland Mitigation Sites

Yellow Dog River	Michigamme Township	T50N, R29W, Section 24
Dead River East	Champion Township	T49N, R29W, Section 11
Brocky Lake East	Ely Township	T48N, R28W, Section 8
Connors Creek	Champion Township	T49N, R28W, Section 31
Peterson-Holli	Champion Township	T48N, R29W, Section 26

CR 595 Latitude/Longitude

North end @ Triple A Road	46.736983/-87.862098
South end @ US 41	46.497032/-87.896234

Permit Application Section 3 – Project Description

Waterbodies

Middle Branch Escanaba River
Second River
Trembath Lake Outlet
Unnamed Creek
Kipple Creek
Trib to Kipple Creek (2)
Trib. to Dishno Creek
Trib. to Voelkers Creek
Voelkers Creek
Dead River
Wildcat Canyon Creek (3)
Trib. to Wildcat Canyon Creek
Trib. to Mulligan Creek (5)
Mulligan Creek
Yellow Dog River
East Branch Salmon Trout River

Construction Notes:
All "upland drainage" culverts under CR 595 are shown on the project plans in this permit application. However, cross-sections are only provided for those upland drainage culverts that have one end in wetland. There are also culverts shown on the plans that are proposed within upland drainageways adjacent to driveways and/or roads which are not considered regulated activities. Specific construction details are not provided in this permit application for those types of culverts.

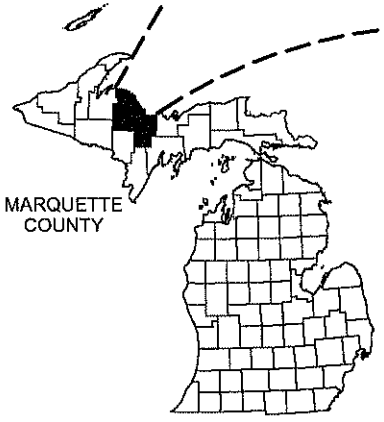
Excavated organics and topsoil will be stockpiled within the construction limits of the proposed road and placed as top cover on finished slopes and to provide the necessary organic layer within the wetland creation areas or placed at an upland location outside of any existing wetland or 100-year floodplain.

Place temporary construction pads within wetland as necessary to provide access to stream crossing locations or provide access to the construction areas. The temporary fill impacts will not exceed 1,000 square feet and temporary fill volume will not exceed 25 cubic yards. Each temporary structure or construction mat will be limited to 0.1 acre in size.

Michigan Department of Environmental Quality-accepted best management practices for watercourse crossings will be used to bypass flow around the stream crossing installations during construction in order to maintain stream flow downgradient of the crossings and allow for construction to occur in "dry" conditions.

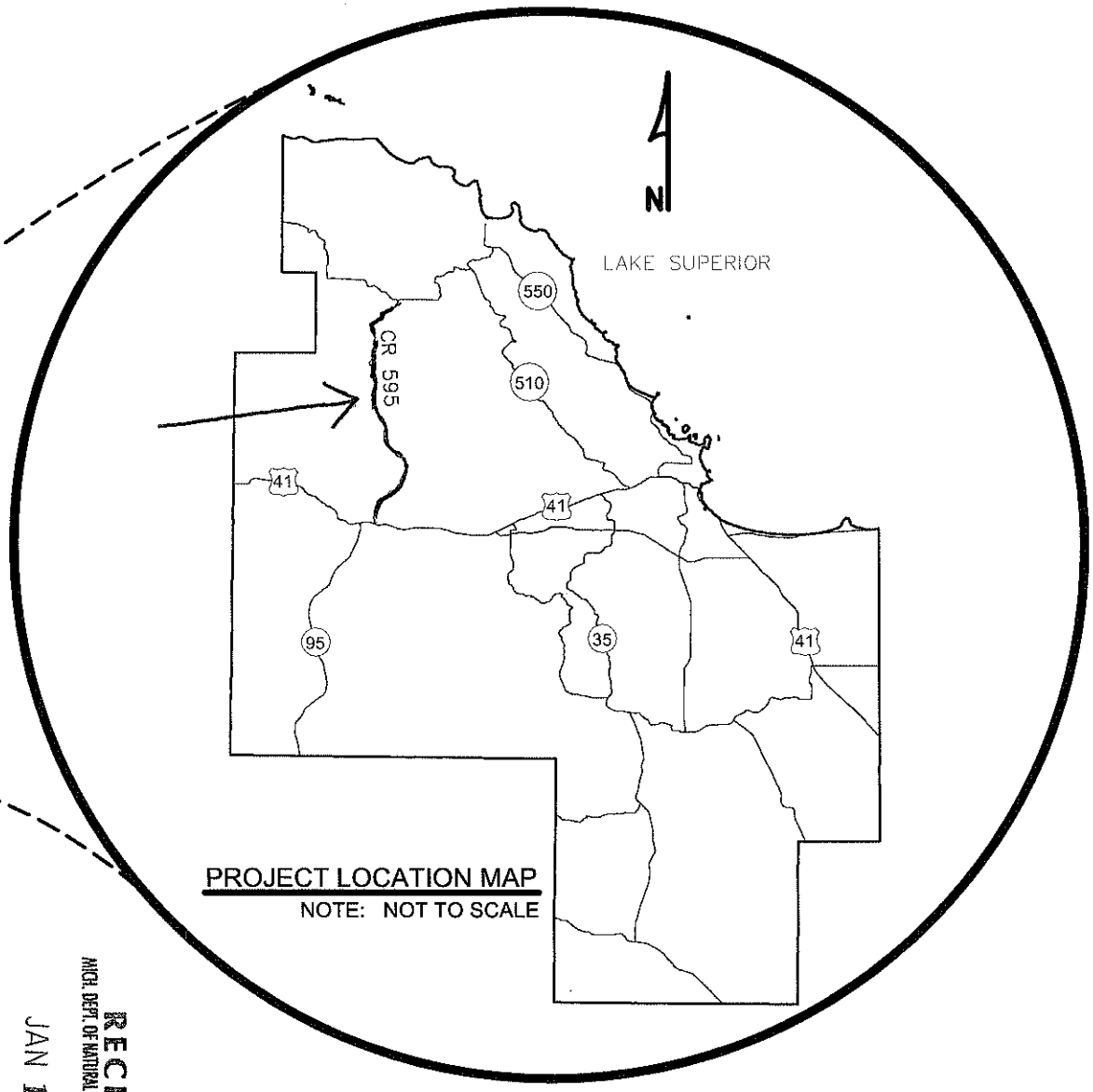
During excavation activities in wetland, dewatering may be performed to assist in soil removal. Water is intended to be discharged over upland or into geotextile filter bags to control sedimentation.

It is possible that at certain wetland crossing locations the depth of unstable soils may be such that excavation will need to be performed beyond the currently anticipated area of disturbance (slope stake line) shown on the plans adjacent to the road. These adjacent areas will be restored to original wetland grade with at least six inches of organic topsoil following road bed installation.



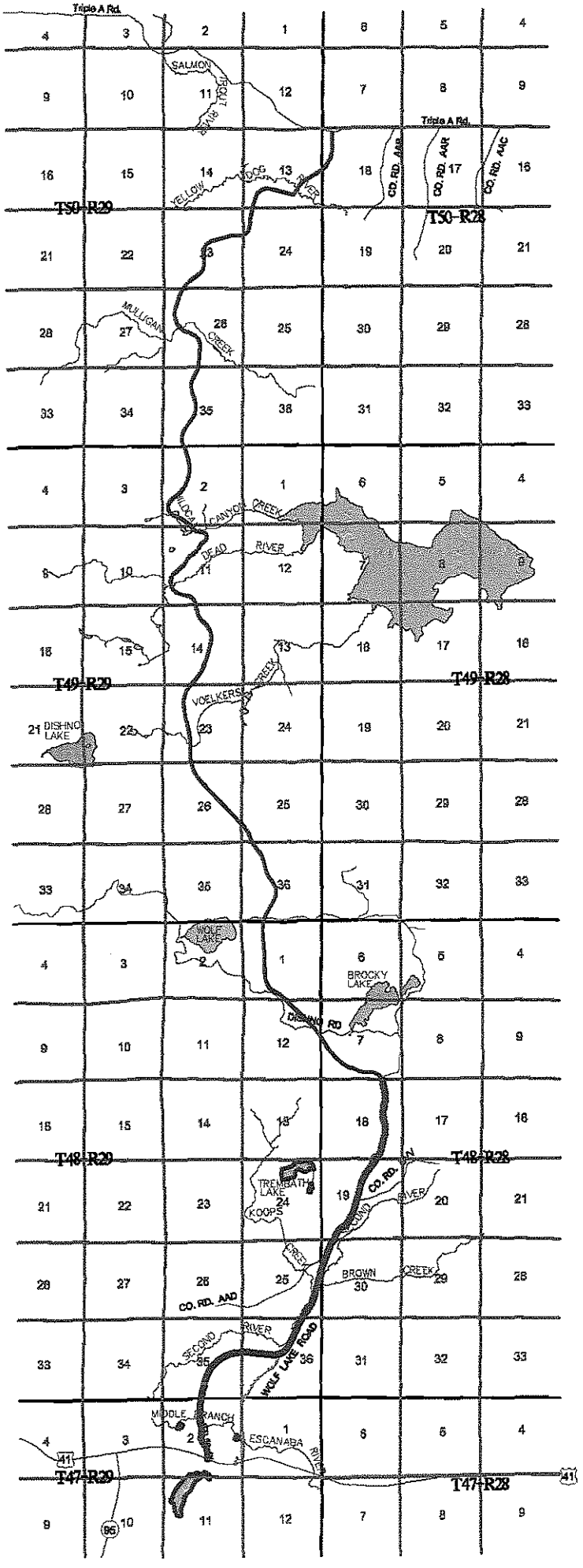
COUNTY LOCATION MAP

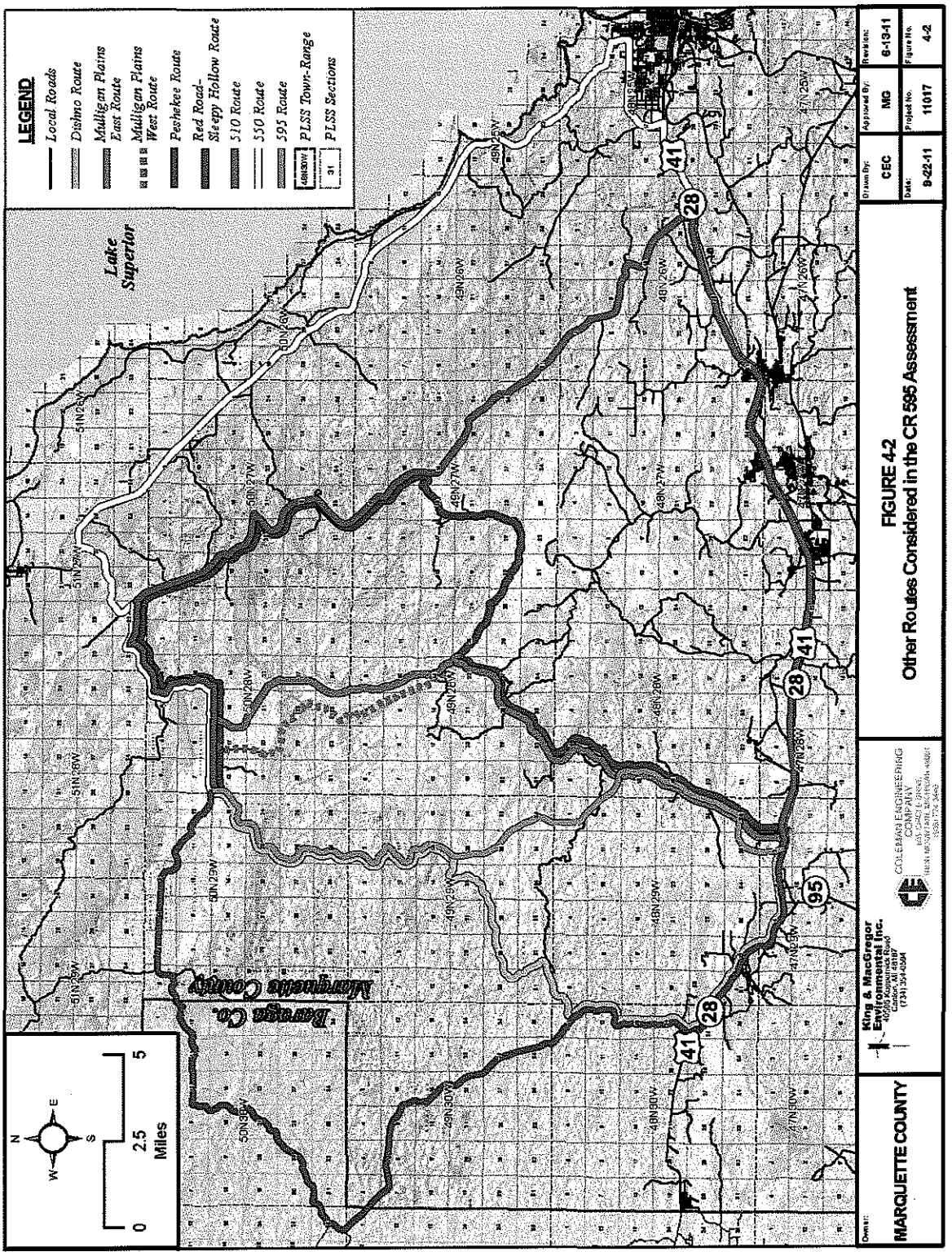
NOTE: NOT TO SCALE



PROJECT LOCATION MAP

NOTE: NOT TO SCALE


Triple A Rd.
SALMON TROUT RIVER
YELLOW DOG RIVER
CO. RD. AAB
CO. RD. AAR
CO. RD. AAC
T50-R29
T50-R28
MULLIGAN CREEK
T49-R29
T49-R28
DEAD RIVER
VOELKERS CREEK
DISHNO LAKE
WOLF LAKE
BROCKY LAKE
DISHNO RD
T48-R29
T48-R28
TREMBATH LAKE
KOOPS CREEK
BROWN CREEK
CO. RD. AAD
SECOND RIVER
WOLF LAKE ROAD
MIDDLE BRANCH
ESCANABA RIVER
T47-R29
T47-R28
41
95



CR 595 Project Overview

The Marquette County Road Commission (MCRC) is submitting this application for permit to the MDEQ under the Michigan Natural Resources and Environmental Protection Act, PA 451 of 1994, Part 303 (Wetland Protection), Part 301 (Inland Lakes and Streams) and Part 31 (Floodplain Regulatory Authority) for the construction of a new primary county road. MCRC is granted the authority by law to provide and maintain the public road infrastructure of Marquette County. As the purpose and need for a new county road is demonstrated, MCRC has responsibility to obtain approval and coordinate the construction of the road.

Project History

A number of Marquette County governmental agencies, including the Marquette County Board of Commissioners; the City of Marquette; the boards of Marquette Township, Humboldt Township, Champion Township, Ely Township, Powell Township, and Michigamme Township; and local businesses and industry have been attempting to resolve the heavy truck transportation issues in the region, particularly traffic originating from the area northwest of the City of Marquette and traveling through the city. The expected increase in truck and other traffic associated with the Eagle Development Project in concert with public officials' efforts to address the long-term transportation needs for better logging access and emergency access to northwest Marquette County have now made resolving this issue a critical need for Marquette County.

On October 4, 2010, Gerald O. Corkin, Chairman of the Marquette County Board of Commissioners, sent a letter to James Iwanicki, Engineer/Manager of MCRC urging MCRC to construct the new road. The October 4, 2010 letter stated, *"there would be many public benefits from the new road. The road would improve access to recreation land, western Marquette County businesses would benefit from a safe, efficient transportation route, and truck traffic from the Kennecott mine would use the new road rather than US-41/M-28, CR 510, CR 550, CR 492, CR 502, and CR 473, improving safety on existing state highways and county roads. In addition, the new road would greatly benefit the timber industry."* At its public meeting on October 18, 2010, MCRC adopted a resolution. This resolution made the following findings, in part:

- *"Whereas, a public need for a new road has been identified and established by the Marquette County Road Commission, the County Board of Marquette, and all four affected townships (Champion, Ely, Humboldt, and Michigamme);*

- *Whereas, a public need for a new road has been identified by other local government agencies such as the City of Marquette, Powell Township, and Marquette Township that are indirectly affected;*

- *Whereas, developing a new all-season primary county road to run north-south beginning at the intersection of US-41/CR FY northerly to CR IAA is in the public's best interest;*

- *Whereas, this new road will provide additional recreational opportunities to the public as well as provide a direct benefit to the timber, mining, and gravel industries;*

- *Whereas, highway public safety, emergency response, and emergency services will be significantly enhanced;"*

The resolution concluded, in part, "*that it is in the public's best interest to create a new all-season primary county road to run north-south beginning at the intersection of US-41/CR FY northerly to CR IAA and the name of the route shall be known as CR 595*". (Triple A Road is officially designated as CR IAA in Michigamme Township.)

Purpose and Need

The purpose of the proposed CR 595 project is to construct a primary county north-south road that 1.) connects and improves emergency, commercial, industrial and recreational access to a somewhat isolated but key industrial, commercial and recreational area in northwest Marquette County to US-41; and 2.) reduces truck travel from this area through Marquette County population centers.

The proposed CR 595 will be a public road, with all of the associated benefits that go with that designation. Those benefits include the fact that the new road will be open to public use and will be maintained as part of the Marquette County road system. All traffic laws will be enforced by law enforcement agencies such as the Michigan State Police, Marquette County Sheriff's Department, and possibly township law enforcement agencies. It will be located in northwest Marquette County where the land use is best described as primarily commercial timber production and recreation. The landscape is rugged in many places with steep terrain and large bedrock outcrops. There are many streams with riparian wetlands and isolated wetlands of varying sizes and types. There is very little non-forested open land. The forested lands are generally in various stages of succession; from mature timber stands to clear-cut or selectively harvested areas. Logging roads and trails lace the landscape as a result of past timber harvests. These roads and trails are actively utilized for recreation all year, due to most of the timber production lands being open to public use.

Logging and mining have been integral to the base economy of Marquette County and the entire western Upper Peninsula since settlement. The value of the logging and mining industries to this region is significant. Much of the infrastructure in Marquette County can be attributed to these two industries; including roads, power plants and hydropower facilities, recreation amenities, and public services. This proposed project, the construction of a new primary county road to serve these two heritage industries as well as providing access to lands for recreation and other public benefits, is essential public infrastructure to continue to support these baseline industries that form and sustain the region's economy. The full economic benefits of the mining and logging industries cannot be realized without the proposed road.

The need for the proposed road has been known for many years by the general public and public officials of Marquette County. However, mining has focused the need for a new public

road in northwest Marquette County. Although CR 595 is extremely important, the proposed public road will serve many more purposes and needs. There is presently only a single public road (Triple A Road) to serve the Eagle Development Project. Triple A Road has historically been a seasonal county road. If it is blocked or impassible during an emergency (e.g. forest fire, facility accident, severe weather, etc.) then public safety may be compromised. With the large number of people that will be employed by the Eagle Development Project, in addition to contractors, vendors, and governmental agency personnel that will provide services at the facility, an additional public road access is essential for public safety and emergency response. CR 595 would provide much more efficient access to this northern area of Marquette County; this second public road access will become a necessity in light of the number of people that will be employed in the mining and forest industry in northwestern Marquette County.

Proposed Regulated Activities and Alternatives

This permit application is intended to combine the demonstration of purpose and need for the proposed road along with an assessment of the impacts of the project to the public trust, riparian rights, and the environment; as well as to provide an analysis of the alternatives to the proposed action and offer mitigation for unavoidable regulated resource impacts.

The proposed CR 595 is a modified and revised route from that of the previously proposed Woodland Road by Woodland Road LLC. Documents included with this application for permit contain references to routes and studies conducted for Kennecott Eagle Minerals Company (KEMC) and/or Woodland Road LLC prior to the MCRC initiating the proposed CR 595 project in October 2010. The MCRC has been authorized by KEMC to use these studies and documents to save duplication of effort and time. The Woodland Road studies and surveys were critical to the overall planning for the CR 595 project and as such the pertinent information is part of the supporting documentation included in this application for permit.

After the withdrawal of the Woodland Road application for permit by the Woodland Road LLC in May of 2010, KEMC and its contractors continued to evaluate potential alternative routes to serve the Eagle Development Project. KEMC initiated a comprehensive evaluation of the CR 510-Red Road-Sleepy Hollow and the CR 550 routes. The additional environmental and engineering studies conducted for the CR 510-Red Road-Sleepy Hollow and the CR 550 routes considered in the Woodland Road project are referenced in detail in the Alternatives Analysis and Project Assessment document. However these studies are for comparative or informational purposes only, as MCRC has determined these routes to be "no build" alternatives.

The proposed CR 595 would result in the total wetland impacts of 25.81 acres of wetlands over a distance of 21.4 miles. Included in the total wetland impacts for the CR 595 project are impacts to 0.35 acres of wetland associated with the necessary relocation of snowmobile Trail 5 (the application for permit to be filed for by others) and 0.01 acre of wetland impact associated with the East Branch Salmon Trout River stream mitigation project. Also, there are 22 stream crossings (bridges or concrete box culverts) along the proposed CR 595 and one stream crossing on the East Branch Salmon Trout River stream mitigation project.

Avoidance, Minimization and Mitigation

Avoidance and minimization of stream and wetland impacts have been a primary focus during the planning and design of the proposed CR 595 in order to provide a road alignment that will meet regulatory criteria for permit issuance. Design criteria modifications in the location of the road and the road design have been made for the sole purpose of avoiding or minimizing impacts to wetlands. Higher quality wetlands (e.g. undisturbed riparian wetlands) have been avoided to the extent possible. Wetland impacts have been minimized by decreasing road fill depths (i.e. lowering road grade), steepening the side slopes of the road embankment fill in wetlands to reduce the base width of the road embankment (which requires installation of guardrail in these sections) and adjusting the horizontal alignment of CR 595 in efforts to minimize wetland encroachment.

The primary method of wetland mitigation for CR 595 is the proposed creation of 49.4 acres of new wetlands to offset the unavoidable impacts to wetlands that would result from the project. In addition, approximately 3.5 acres of wetland restoration is proposed in several small areas, although for purposes of this permit application MCRC is not seeking credit for this restoration/mitigation activity. No wetland preservation is proposed by the MCRC for CR 595. Impacted emergent and scrub-shrub wetland types will be replaced at a ratio of 1.5 to 1 (i.e. 1.5 acres of emergent wetland created for each acre of emergent or scrub-shrub wetland impacted). Forested wetland areas will be replaced at a ratio of 2 to 1. In addition, there will be compensatory floodplain cuts provided for permitted floodplain fill. It is possible that those areas of upland compensatory cut can also be converted to wetlands if hydrologic conditions are suitable and organic soils can be placed. This aspect of potential wetland creation is also not part of any calculated wetland mitigation area(s).

Stream mitigation will be multi-faceted and entails studies conducted during the design phase of the project, implementation of special design criteria, and stream mitigation projects that will be implemented during construction. The stream mitigation plan includes the following four components:

- The implementation of Stream Simulation Methodology for stream crossings;
- The proper replacement of inadequately sized existing culverts or bridges;
- The design of the proposed road to direct runoff to uplands and wetlands and not directly into streams; and,
- Stream restoration on East Branch Salmon Trout River crossings of Triple A Road.

Summary

The proposed CR 595 project is a significant transportation infrastructure improvement project that would serve the public safety needs of the community as well as provide needed access to an important mining, logging, and recreational area of northwest Marquette County. Existing roads do not provide for the public safety needs of the community or the level of service that the uses of the area now demand, and especially will demand when Eagle Development Project is in operation. The CR 595 construction would directly create

an estimated 200 jobs and the related benefits to the area businesses would be significant. CR 595 would not only improve public safety in the area but it would greatly improve the operating efficiencies for mining and logging, and result in a more viable business environment.

Impacts to wetlands are unavoidable with the proposed CR 595 project, but extensive planning and engineering design for the road has resulted in avoiding wetlands to the extent practicable and in minimizing impacts as much as possible. There will be 25.81 acres of wetlands to be impacted by CR 595, the East Branch Salmon Trout River stream mitigation project and the Trail 5 relocation. Impacts will be mitigated by the creation of approximately 49.4 acres of new wetland, as well as implementation of significant stream restoration measures.

In conclusion, the CR 595 project is important to the health, safety, and welfare of the public and is beneficial for the general public, businesses, the local and regional economy and local governmental agencies. The public trust in the resources that would be impacted by the project has been protected to the extent feasible and measures will be implemented to mitigate unavoidable impacts.

3.0 PURPOSE AND NEED FOR THE PROPOSED ROAD

Transportation planning to serve economic growth, recreation, and landowner needs revolves around the determination of purpose and need for any particular project. By land area, Marquette County is the largest county in Michigan and is the 17th largest county east of the Mississippi River. MCRC maintains 284 miles of primary county roads, 988 miles of county local roads, 93 county bridges, and maintains 169 miles of state trunkline under contract from the State of Michigan.

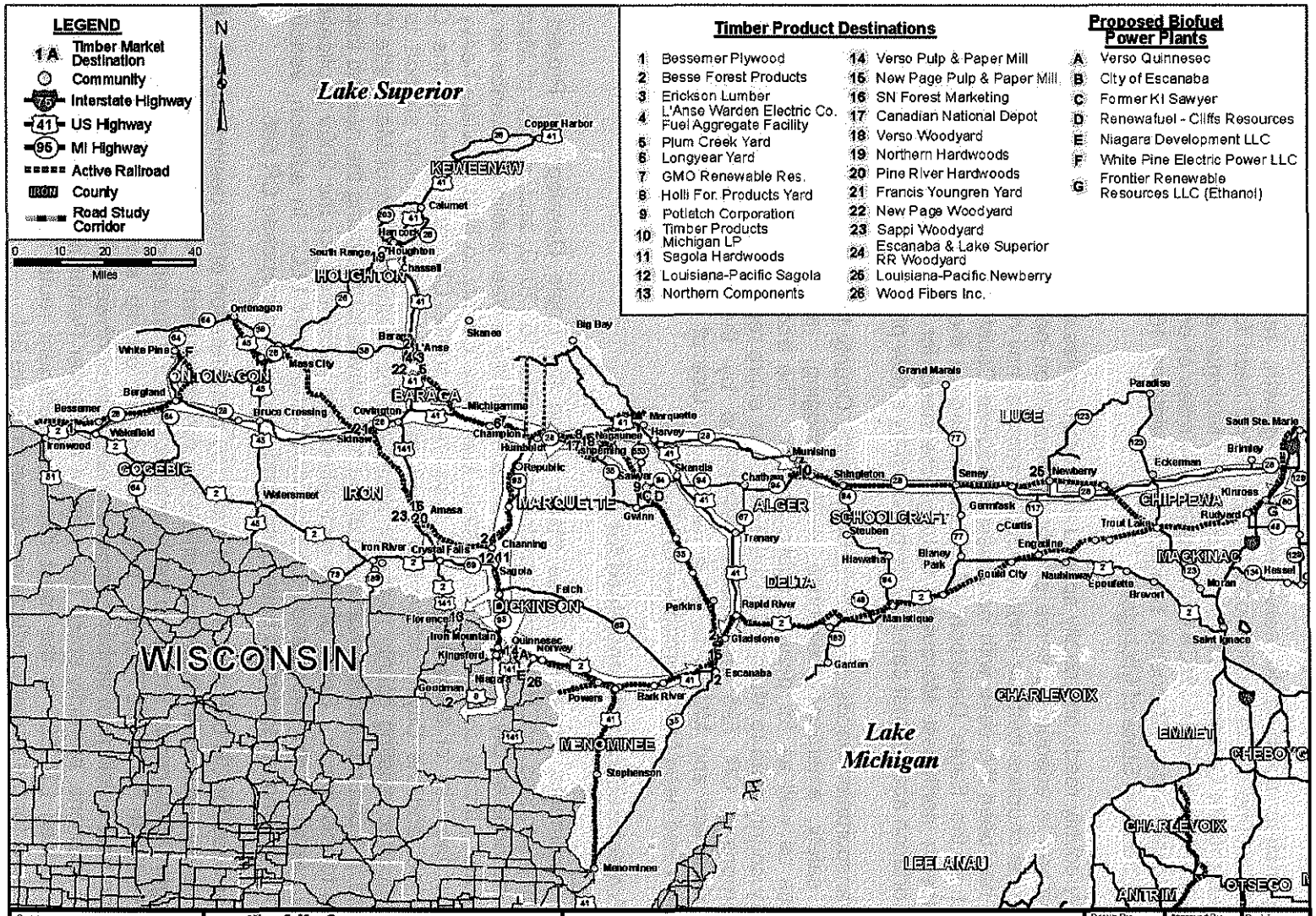
Primary county roads are ideally spaced about eight miles apart in north-south and east-west orientations to adequately serve county transportation needs. Of course, some areas of more rural counties that are undeveloped or remote may not require a primary county road, which has been the case with northwest Marquette County in the past. However, with the advent of the Eagle Development Project added to the timber industry and recreation activities in northwest Marquette County, the need for the proposed CR 595 requires transportation access that can only be provided by a new primary county road to this area.

The transportation needs of northwest Marquette County have been carefully evaluated for public safety, emergency response, mining, logging, aggregate industries and related services as well as for general public access. The economic benefits of the proposed primary county road to Marquette County and the entire region are such that construction of the proposed CR 595 has been determined by the Marquette County Board of Commissioners and MCRC to be a necessity. Use of existing roads will not fulfill the demonstrated need for the proposed CR 595.

3.01 Project Background and Need for Action

Public comments, especially those made during the Eagle Development Project mine permitting process, MCRC public hearing on October 18, 2010, and at City of Marquette public hearings on city street truck restrictions, identified a clear public preference for a new north-south primary county road in western Marquette County to help alleviate heavy truck traffic in the City of Marquette, as well as in Marquette Charter Township, the City of Negaunee, and the City of Ishpeming. This public input and community support to seek alternatives to existing county roads for access to the northwest part of Marquette County resulted in a comprehensive evaluation of the alternatives for providing the needed improved access to this region. Some of this evaluation was performed for the 2009 application for MDEQ permit for the Woodland Road by Woodland Road LLC. In addition, various and detailed environmental studies have been conducted for the proposed CR 595.

Another need for CR 595 may be best shown by consideration of the destinations of the bulk of the heavy truck traffic that would utilize the proposed road. Ore will be transported from the Eagle Development Project to the Humboldt Mill for initial processing; rock backfill will be hauled back to the Eagle Project. Timber in the form of pulp, saw logs, and chips is hauled from the vast holdings of timber company property in northwest Marquette County to mills in various locations, primarily south and west in the Upper Peninsula and northern Wisconsin. The proposed CR 595 is the most direct and efficient route for these industries. The destinations for the timber products are shown in Figure 3-1.


LEGEND
1A Timber Market Destination
Community
Interstate Highway
US Highway
MI Highway
Active Railroad
County
Road Study Corridor
0 10 20 30 40
Miles
N
Timber Product Destinations
1 Bessemer Plywood
2 Besse Forest Products
3 Erickson Lumber
4 L'Anse Warden Electric Co. Fuel Aggregate Facility
5 Plum Creek Yard
6 Longyear Yard
7 GMO Renewable Res.
8 Holli For. Products Yard
9 Potlatch Corporation
10 Timber Products Michigan LP
11 Sagola Hardwoods
12 Louisiana-Pacific Sagola
13 Northern Components
14 Verso Pulp & Paper Mill
15 New Page Pulp & Paper Mill
16 SN Forest Marketing
17 Canadian National Depot
18 Verso Woodyard
19 Northern Hardwoods
20 Pine River Hardwoods
21 Francis Youngren Yard
22 New Page Woodyard
23 Sappi Woodyard
24 Escanaba & Lake Superior RR Woodyard
25 Louisiana-Pacific Newberry
26 Wood Fibers Inc.
Proposed Biofuel Power Plants
A Verso Quinnesec
B City of Escanaba
C Former KI Sawyer
D Renewafuel - Cliffs Resources
E Niagara Development LLC
F White Pine Electric Power LLC
G Frontier Renewable Resources LLC (Ethanol)
Lake Superior
Lake Michigan
WISCONSIN
KEWEENAW
HOUGHTON
ONTONAGON
BARAGA
MARQUETTE
ALGER
SCHOOLCRAFT
DELTA
DICKINSON
MENOMINEE
GOGEBIC
IRON
LUCE
CHIPPEWA
MACKINAC
CHARLEVOIX
EMMET
CHEBOYGAN
LEELANAU
ANTRIM
OTSEGO
Copper Harbor
Calumet
Hancock
Houghton
South Range
Chassell
Ontonagon
White Pine
Mass City
Bergland
Bessemer
Wakefield
Ironwood
Bruce Crossing
Covington
Skanee
L'Anse
Baraga
Big Bay
Michigamme
Champion
Humboldt
Republic
Marquette
Harvey
Negaunee
Sawyer
Gwinn
Skandia
Chatham
Munising
Grand Marais
Shingleton
Seney
Newberry
Paradise
Eckerman
Brimley
Soult Ste. Marie
Kinross
Rudyard
Trout Lake
Engadine
Naubinway
Epoufette
Brevort
Moran
Hessel
Saint Ignace
Gamfisk
Curtis
Blaney Park
Hiawatha
Steuben
Manistique
Gulliver
Garden
Gladstone
Escanaba
Rapid River
Perkins
Trenary
Amasa
Crystal Falls
Iron River
Watersmeet
Channing
Sagola
Felch
Florence
Iron Mountain
Kingsford
Quinnesec
Norway
Niagara
Powers
Bark River
Stephenson
Menominee
Owner:
MARQUETTE COUNTY
King & MacGregor Environmental Inc.
40595 Koppernick Road
Canton, MI 48187
(734) 354-0594
COLEMAN ENGINEERING COMPANY
635 CIRCLE DRIVE
IRON MOUNTAIN, MICHIGAN 49801
(906) 774-3448
FIGURE 3-1
County Road 595
Map of Timber Destinations
Drawn By: CEC
Approved By: DWS
Revision: 6-10-11
Date: 9-22-11
Project No. 11017
Figure No. 3-1

Employees and potential employees working in the forests of northwest Marquette County at the Eagle Mine that live in western Marquette County or in Baraga County would have a route to work on CR 595 that would be a much shorter distance than using existing roads. For example, employees traveling from the M-95/US-41 intersection to the Eagle Mine would save about 80 miles per round trip. If CR 595 is not available, these workers may not find it feasible to drive that distance to work, especially in winter. Over the course of a year the use of existing roads compared to CR 595 could add nearly 10,000 miles of driving for each employee living in the western areas of Marquette County.

3.01.A. Documentation of Eagle Development Project Needs for CR 595

The KEMC Eagle Development Project is under construction, with the start of production presently planned for late in 2013. When the mine was permitted by MDEQ under Part 632, CR 550 was the intended access route. Substantial public concern about/with CR 550 being the mine access route resulted in KEMC evaluating alternate routes, and eventually participating with Woodland Road LLC in proposing Woodland Road in an application for permit filed with MDEQ in August 2009. Over 900 citizens from Big Bay, the City of Marquette, as well as residents along CR 550 have requested (through signed petitions) that an alternate route for truck traffic on CR 550 and CR 510 be found.

In May 2010, Woodland Road LLC withdrew the application for permit due to the inability to resolve pending issues with the project as raised by MDEQ and EPA prior to permitting deadlines. After withdrawal of the application, KEMC made a decision to proceed with CR 550 as the primary transportation route for the Eagle Development Project. The decision to utilize the CR 550 route, a portion of which travels through the cities of Marquette, Negaunee, and Ishpeming, caused substantial concern among local governmental units and the general public, which eventually resulted in MCRC being requested by the Marquette County Board of Commissioners to seek approval to build CR 595.

The need for CR 595 for the Eagle Development Project has not changed substantially from that presented in the Woodland Road application for permit. The primary benefits of CR 595 compared to CR 550 as the primary access route are as follows:

- CR 595 is a direct route to US-41 near the Humboldt Mill and at 21.4 miles in length is 38.6 miles shorter than the CR 550 route to the intersection of US-41 and CR FY. This reduced road length will save an estimated 1.4 million miles of truck travel alone per year for hauling ore from Eagle to Humboldt using the CR 550 route and will have a resultant reduction in greenhouse gas emissions and fuel savings.

- Although the total overall cost of utilizing the CR 550 route compared to constructing and using CR 595 is about the same for the Eagle Development Project, the reduction of miles traveled in areas of development and heavy traffic will reduce the chances of accidents if the CR 595 route is implemented. Safety is a top priority of MCRC and KEMC .

- CR 595 will reduce access time for emergency services to the mine site, reduce travel for employees that live in the west part of Marquette County or Baraga County, and will provide an important access upstream of the Dead River dam system in case of flooding that may cause bridges to be closed.

To summarize the values for the proposed CR 595 to the Eagle Development Project, the road would minimize a substantial amount of potential problems with traffic in municipal areas, improve safety, create energy savings, and facilitate employee and emergency services access.

3.01.B. Documentation of Logging Industry Needs for CR 595

The proposed CR 595 project is an important need for the timber companies and other companies associated with logging to maintain a viable business based on growth and sustainable harvest of timber on the extensive land holdings in northwest Marquette County and eastern Baraga County. Not only would timber companies benefit directly from CR 595, but the many businesses that serve the timber industry as well as the general public would also benefit. Improved safety for hauling timber as well as emergency response to logging accidents are also very important attributes of CR 595 for the timber industry.

CR 595 will make the harvest of timber more efficient due to the improved access for getting timber to markets and yards in the western UP and northern Wisconsin. This improved efficiency of operations attributed to CR 595 would have a secondary positive impact on the general public that hunts, fishes, gathers, and otherwise enjoys recreation on the thousands of acres of timber company lands open to public use through the Commercial Forest Act (CFA) designation on most of these properties. If the production and harvest of timber becomes so inefficient due to poor access, lands could be sold and the right of the public to recreate on these lands may then be lost.

The primary timber producing companies in northwest Marquette County were asked for input to document their need and level of predicted use of CR 595. Plum Creek Timber Company, J.M. Longyear LLC, GMO, and Holli Forest Products provided data that is depicted in Table 3-1.

Table 3-1. Timber Company Activities and Annual Estimated Level of Use for CR 595

Activity or Factor	Anticipated Level of Use (Round Trips)				Totals
	A*	B	C	D	
Land and Timber Management Trips per Year by Landowner or Contractors	210	50	345	50	655
Timber Harvest Traffic (i.e. Service and Equipment Mobilization)	110	20	80	25	235
Logging Contractor Employees Daily Access Trips per Year	250	100	1,200	100	1,750
Total Trips per Year to Service or Manage Timber and Timber Harvests	570	170	1,625	175	2,640
Average Annual Timber Harvest (acres)	1,800	250	2,000	200	4,250
Average Number of Loads of Timber Annually	900	100	860	200	2,060
Reduction in Loads Hauled Through Marquette Annually	230	20	834	200	1,284
Approximate Number of Logging Contractors Involved in Timber Harvest	4	2	5	1	9-12
Approximate Number of Trucking Contractors Involved in Timber Harvest	20	4	15	1	35-40
Approximate Number of Maintenance/Service Companies Serving Timber Contractors	6	2	5	2	6-15
Estimated Reduction of Annual Miles for Timber Transport Trucking Only	54,000	5,000	43,000	10,000	112,000
Reduction in Average Cycle Time for Trucking Contractors to Haul Timber to Market Destination/Yards (hours)	2	1.5	2	1	--
Reduction in Fuel Cost and Gallons @ $4.00/Gallon	$72,000 18,000 gallons	$7,000 1,600 gallons	$49,200 12,300 gallons	$11,200 2,800 gallons	$139,400 34,700 gallons
Reduction in Loads of Timber Hauled Through L'Anse Annually	200	0	0	0	--

*Company names have not been included for proprietary reasons; companies responding with this information are listed as A, B, C, or D.

There is substantial traffic associated with timber management and harvest in northwest Marquette County. As shown in the first three rows of Table 3-1, travel on CR 595 associated with workers accessing their work sites in this area (not including the hauling of harvested timber) would amount to an estimated 2,640 round trips per year, most of which must presently travel on CR 510 or CR 550 and through Marquette. Add to that the 2,060 loads of timber hauled out of the woods from the northwest part of the county on an average

annual basis as well as the reduction of about 1,284 loads that now travel on CR 550 and through the City of Marquette, and the significance of CR 595 is evident.

Table 3-1 provides data on the annual impact of the timber industry on the economy of Marquette County and surrounding areas and the potential benefit of CR 595. The four largest timber companies in Marquette County provide employment for the following:

- An estimated nine to 12 logging contractors, with each logging contractor having multiple employees;

- An estimated 35 to 40 trucking contractors to haul the timber out of the woods and to market destinations, with each trucking contractor having multiple employees;

- An estimated six to 15 service companies that provide fuel delivery, equipment maintenance, and other supplies to the logging and trucking contractors in the field. There are many more businesses that support the logging and trucking contractors and benefit from their business, such as logging equipment dealers, truck dealerships, and automobile and truck parts/supplies stores, etc.

The annual reduction in miles traveled, the gallons of fuel saved, and the associated cost savings shown in Table 3-1 if CR 595 is constructed are significant. About 112,000 miles of truck travel will be saved annually if CR 595 is built, at a savings of 34,700 gallons of fuel at $4.00 per gallon that would cost about $139,000. Not only are the costs associated with this truck travel savings important, but also significant are the thousands of hours that trucks would not have to be on the road to haul the same amount of timber. In addition, the miles of travel saved and the reduced fuel consumption by pickup trucks and other vehicles accessing logging operations by being able to use CR 595 would be substantial, although not quantified in this report.

The proposed CR 595 is extremely important to the timber companies and those dependent on the logging industry, with the primary benefit being the overall reduction in hauling distance to get the forest products to markets/yards. Making trucking more efficient is extremely important to the operation of the timber product trucking industry and the long-term success of the timber companies.

Presently there is no direct road access to the south from the Yellow Dog Plains for timber companies to transport timber from the north part of Marquette County to markets. When timber lands generally north of the Yellow Dog River are harvested, the timber must be hauled out on Triple A Road, Ford Road, or Northwestern Road either east to CR 550 through Marquette or west through Baraga County to L'Anse, a long and difficult route. CR 595 would provide the best route south to US-41 connecting the timberlands in the north part of Marquette County more directly to markets and timber yards (Figure 3-1).

In summary, the timber industry has the most substantial long-term need for CR 595. Timber production, especially hardwoods, takes decades to grow to a point where harvest is possible and profitable. The long-term viability of the timber industry in northwest Marquette County will be strongly benefitted by CR 595 with improved access as well as avoidance of hauling thousands of loads of timber through residential and commercial portions of the County each year.

3.01.C. Emergency Medical Services Benefits of CR 595

The proposed CR 595 is not needed simply for economic reasons; there is a demonstrable need for improved access to northwest Marquette County for emergency access for fire control, emergency medical services, search and rescue, and for recreational access. There is a significant timber resource in northwest Marquette County, and fire suppression as provided by the MDNR is critical to protecting these resources. In addition, providing better firefighter and emergency access to camps in the area is an important benefit. According to the Bureau of Labor Statistics, logging is the second-most dangerous occupation in the United States and truck driving is the ninth-most dangerous occupation (US Department of Labor 2010). Emergency services are frequently needed to respond to accidents in northwest Marquette County.

Emergency personnel response times to northwest Marquette County are a critical consideration for protection of the public health, safety, and welfare. There are multiple responding locations for Emergency Medical Services (EMS), fire, and law enforcement for calls from northwest Marquette County and therefore response times vary.

Bell Hospital EMS provides services for the portion of Marquette County west of the Michigan State Police Post, including Michigamme, Champion, Ishpeming, and Ely townships. Bell Hospital EMS is responsible for responding to emergencies at the Eagle Development Project. Bell Hospital in Ishpeming has four transport ambulances and one non-transport ambulance and the service is staffed 24 hours a day, seven days a week with professional EMS personnel. This professional on-site staffing can be critical in the case of life-saving calls where time saved can result in a life saved.

According to Don Manty, Director of Emergency Medical Services for Bell Hospital, CR 595 would fill a significant need for responding to EMS calls in northwest Marquette County. Responding to emergencies during the winter would be especially aided by CR 595 due to the shorter distance that snowmobile units with rescue sleds would have to travel from accident sites to reach an ambulance waiting on CR 595. Logging accidents are frequent in northwest Marquette County and requests for assistance from recreationists are also common. CR 595 would significantly enhance response time for EMS in this area.

Presently if a 9-1-1 call for assistance comes in to Central Dispatch for an emergency in northwest Marquette County, an EMS unit would likely be dispatched from the station in Big Bay, which is 20-30 minutes response time to Eagle Development Project (according to the Marquette County Emergency Management Coordinator). The Eagle Development Project is the most likely location for future emergency calls due to the nature of the activity there and the large number of people that are presently working there, or will be employed there when the facility is operational. CR 595 would not decrease this response time for EMS responding from Big Bay; but if additional assistance is needed, EMS would presently be dispatched from Marquette or Ishpeming.

CR 595 would allow 24/7 response from Bell Hospital EMS with a similar response time as Big Bay, and if Big Bay EMS is on another call and not available then Bell Hospital would be able to respond with a similar response time as Big Bay. Return time to Bell Hospital is less than the time to Marquette General Hospital. Presently the response time from Bell Hospital through Marquette to the Yellow Dog Plains is about 90 minutes. Response time on CR 595 from Ishpeming is estimated to be 30 minutes. However, if there is an accident in northwest

Marquette County and multiple EMS units are needed, then CR 595 would be critical for EMS units from Bell to respond and transport victims to Bell Hospital.

In summarizing the benefits of CR 595 for emergency services, it is not the emergency services that benefit, but the people that are being served by the EMS personnel that will benefit. Improving public safety is a critical reason for building CR 595, as shown in this assessment. CR 595 can reduce response times to a substantial area of Marquette County, which may ultimately save human life.

3.01.D. Benefits of CR 595 for Fire Response

CR 595 would provide much improved fire department access for Champion, Humboldt, and Michigamme departments to portions of their townships. Small forest fire containment and structure fire response to the Yellow Dog Plains would come primarily from the fire station in Big Bay, with a response time of 30 minutes to Eagle Development Project as a central location (according to the Marquette County Emergency Management Coordinator). MDNR is the agency charged with fighting forest fires and would be called on any forest fire and, according to MDNR Forest Management Division, would have a response time from the MDNR office west of Ishpeming to the Yellow Dog Plains of 70 to 90 minutes, depending on the fire location and equipment responding. If MDNR fire fighters are on another fire, which is frequently the case during peak spring fire season, or if a call comes when staff are not at the MDNR Field Office, response time could be even longer. Response time also is dependent upon the type of equipment. Many of the MDNR trucks are older army surplus vehicles and are relatively slow; response with pickup trucks is faster; however pickup trucks only transport equipment for manual fire suppression.

According to MDNR Forest Management Division, CR 595 would reduce fire fighter response time to the Yellow Dog Plains from the MDNR Ishpeming office to about 45 minutes. The proposed road would also facilitate access for fire fighters to other areas of Marquette County to the north, such as Northwestern Road, and would provide quicker access to some of the lands south of the Huron Mountains.

Forest fire response time can be essential to the success of containing a forest fire, especially in the jack pine plantations common in the Yellow Dog Plains. CR 595 would decrease the average response time for MDNR forest fire personnel to northwest Marquette County by about 50 percent.

As noted by MDNR Forest Management Division, one negative impact of the proposed CR 595 will be that more people may be able to access northwest Marquette County for recreation, which may result in more forest fires, more search and rescue calls, and more EMS calls to this region of the county. MDNR forest fire budget and employee levels have steadily declined and fewer fire fighters are available to fight forest fires. However, the benefits of the improved access for fire fighters outweigh the detriments of having more people in the woods.

Backup units for structure fires in northwest Marquette County presently have to come up CR 550 from/through Marquette and, depending on the location responding, would have at least a 45-minute response time to assist. Given this delayed response time, calls for backup must go out as soon as the situation warrants additional help to avoid fires from getting out of control and becoming threats to other structures, timber resources, or people.

The benefits of improved access for fire fighters would mainly be to protect timber investment because of the relatively sparse density of residential structures northwest of Marquette County. Timber resources are substantial and fire protection is vital. However, having a reasonable response time to fight structure fires is also important.

3.01.E. Benefits of CR 595 for Law Enforcement

Requests for assistance for law enforcement (i.e. Sheriff in Marquette and Michigan State Police in Negaunee) from northwest Marquette County would have a response time of up to one hour (according to the Marquette County Emergency Management Coordinator). Comments regarding the proposed CR 595 were requested from the Michigan State Police and the Marquette County Sherriff's Department. Their comments are provided below.

Michigan State Police

Michigan State Police has a Post east of Negaunee on US-41. According to the State Police, the proposed CR 595 would not have any detriments to State Police services and operations, but CR 595 would be a definite asset to them for north-south access. Presently if a State Police unit is in the west end of Marquette County and receives a call for the Big Bay area and no other units are available to respond, the officer must travel through Marquette and up CR 550 to respond to the call. There are only a limited number of road patrols during certain times of the day. If CR 595 was available, the route would be used when response is needed in northwest Marquette County, which could reduce State Police response time by over an hour.

MCRC requested a Finding of Necessity for CR 595 from the Michigan Department of State Police. A letter from the Commander of Traffic Safety Division dated July 18, 2011 indicated that *"the construction of CR 595 will almost certainly increase traffic safety by creating a more uniform and efficient traffic flow on County Road 550 and along the US-41/M-28 corridor through the Cities of Marquette, Negaunee, and Ishpeming."* The letter is provided in Appendix G.

Marquette County Sheriff

Marquette County Sheriff Mike Lovelace and his staff provided the following information (shown in *italics*) regarding the need for CR 595 and the positive effects the road would have on serving the northwest part of Marquette County. The following italicized paragraphs were only edited for punctuation and formatting.

"Enhancement number one would be the effective and efficient response to any and all incidents, accidents, forest fires, floods, other emergencies and natural disasters in the remote northwestern portions of Marquette County that we did not previously possess. Currently we have to respond via two-track roads with front wheel drive patrol cars, four-wheel drive patrol trucks, ATVs, dirt bike, or on foot with Deputies and/or Search and Rescue volunteers.

"During the winter we would probably have to respond with snowmobiles on the State-maintained snowmobile trails in order to get anywhere as the seasonal roads are not plowed during the winter. Less time in a rescue sled being towed by an ATV on a rough two-track road or trail, or by a snowmobile in the winter with more time spent in an ambulance on

paved roads greatly enhances the chances for a victim's survival. I remember quite some years ago a plane crashed west of Ishpeming Township on approach to the old Marquette County Airport and the only access was on foot by our Deputies and Search and Rescue Team. Obviously a paved county road in this area of the county would only enhance our service to the people we are sworn to protect and serve. Fuel and other operating costs, deputies working hours, and wear and tear on our patrol vehicles will be greatly reduced.

"The second enhancement deals with the elimination of heavy haul truck traffic that would exist on County Roads 510, 550 and US-41/M-28 through the cities of Marquette, Negaunee, and Ishpeming if this road were not (obvious error in that the Sheriff means to say if the road were constructed) to be constructed. Heavy haul truck traffic through these areas would not only be a nightmare for citizens each and every day but also put a tremendous strain on all of the counties already minimally-staffed law enforcement agencies, not just ours, thus maintaining our current level of safety without this increase in traffic.

"The third enhancement deals with the evacuation/access of the northern portion of Marquette County. We had a flood several years ago that took out the bridges on County Roads 510 and 550, virtually cutting off the town of Big Bay from all essential services and goods. Due to the length of the emergency, people began to ship goods and people via boats on Lake Superior back and forth from Big Bay to Marquette and vice-versa. No one could access civilization unless they drove hours through the woods to L'Anse or Skanee on two-track roads. Having the proposed new county road would now allow access to Marquette County and anywhere beyond via U.S. 41 not driving the 4 to 5 hours to Baraga County.

"The current response time to calls for service in the Yellow Dog Plains area depends on the location from where the responding unit is in the county when the call is received. If the unit is in Big Bay or on CR 550, it would be 20 minutes with the current road as it is. If it's in Marquette area, the response time would be approximately 35-45 minutes. All response times are dependent on weather and road conditions at the time. If you're anywhere outside of Marquette city you can add 20-40 minutes to the above-referenced time.

"For the Michigamme Township Officer, who only works day shift Tuesday through Saturday, traveling from the Village of Michigamme to the main gate at Eagle Mine, it's 80 miles and approximately 1 hour and 40 minutes in good driving conditions using US-41 to Wright Street in Marquette, CR 550 to CR 510 to the road known as the Triple A, to the main gate. If an incident occurs beyond the gate anywhere on the AAA/Ford Road/Anderson Corners and beyond, time would be much longer. If you take US-41 to CR 502 (Midway Drive) to CR 510 to the AAA to the gate your miles reduce but because of the dirt road and construction of the road, the time is about the same depending on road conditions. If you take US-41 to Cooper Lake Road to Deer Lake Road to the Red Road to CR 510 to the Triple A Road to the gate, the miles are in between the two listed above but the road type is gravel, twisty, and dirt and the time is about 1 hour 30 minutes. You must also keep in mind that our remaining deputies are only on duty from 8 a.m. to 2 a.m. as the Michigan State Police work midnight shift for us.

"All police, fire and EMS response would be greatly enhanced. As listed above, if there was a Class A paved road and is as straight as possible then the time would be cut by 1/2 to 2/3 the time that it now takes. If a crash with a car, snowmobile, ORV, truck, etc. then the current response time is as stated above, but with the CR 595 road, we can get equipment there in half the time and the chances of saving a life increases greatly. Boaters, lost

hunters, skiers, and hikers can expect a much quicker response and life saving is greatly enhanced. Just being able to cut travel time would allow us to cover more area in less time.

"This road will obviously be used for recreational access to those areas of the county that residents may have previously had very little access. They will be hunting, fishing, hiking, skiing, mountain biking, camping, and who knows what else (Meth Labs?). These individuals WILL at some point become lost, injured, or deceased. My Search and Rescue Team is an invaluable tool that WILL be called out to rescue all types of individuals recreating in this newly-opened area. All of the previously mentioned enhancements will hold true for them also. Faster response time to the incident scene means faster discovery and/or recovery."

Sheriff Lovelace also indicated that the Sheriff's Deputy assigned to the west end of the county (presently funded by KEMC) will patrol CR 595 on a daily basis. Therefore, enforcement of posted speed limits will be conducted.

The benefits of improved access on CR 595 for law enforcement to northwest Marquette County focus on search and rescue and coordination in time of emergencies such as natural disasters (forest fires, flooding, etc.). Although law enforcement officers enforce civil and criminal laws, that activity would not be the primary reason for building CR 595. Public safety is the prime consideration.

3.01.F. Benefits of CR 595 for Access to Northwest Marquette County in a Flood Emergency

As stated in this document, there is a demonstrated need for a second public road access, not only to the Eagle Development Project but also to northwest Marquette County, in case catastrophic weather conditions, fire, or flooding prevent the use of CR 510 or Triple A Road for emergency access to the area. With the large number of people that will be employed at Eagle Development Project, assured emergency access is a necessity. A second public road access is also needed west of Silver Lake Basin in order to provide a reasonable route to northwest Marquette County that is not downstream of the impoundments on the Dead River.

The MCRC has provided documentation of permits issued by the MCRC for hauling heavy equipment during a time when weight restrictions are in effect or for oversize loads associated with emergency repair and maintenance of dams on the Dead River (Appendix J). These permits issued over a 10-year period beginning in 2001 are provided to illustrate the need for an alternate primary county road route upstream of the dams on the Dead River. Situations with the dams that necessitate road closures downstream of the dams when alternate road access to the areas north of the Dead River is needed will definitely occur over time. CR 595 as proposed would provide such emergency access.

Flood emergencies are frightful, as the true power of nature is exhibited in a flood. To have people cut off from emergency services and the ability to obtain food, fuel, and other necessities is extremely problematic to the community. CR 595 would provide an access to northwest Marquette County that is upstream of the series dams on the Dead River in the event of a flood emergency. Copies of some newspaper articles from 2003 that described the flood emergency and associated damages are included in Appendix K.

3.01.G. Finding of Necessity for CR 595 by Michigan Department of Transportation

MCRC requested MDOT to provide comments on the necessity of CR 595 in the road transportation infrastructure in Marquette County. MDOT Director Kirk T. Steudle provided a response letter dated June 2, 2011 (Appendix B). In the letter, Director Steudle states, *"the department supports the MCRC finding that this proposed route is a necessity for providing vital commercial and access improvement benefits for the county."* This support from the director of the state department responsible for the transportation network statewide is important and provides further justification of the purpose and need for CR 595.

3.02 Public Trust

The construction of CR 595 will not impair the public trust or public use of the streams to be crossed. Michigan common law applies the term "public trust" primarily to promote and protect public uses of waterways. In this context, the construction of CR 595 will improve upon the public trust in that it will make waters accessible for public use that are not currently accessible or are difficult to reach. Road construction will not impair navigation since very few of the streams to be crossed are suitable for navigation and those that are will be crossed by bridges that will not interfere with recreational navigation.

In Michigan the concept of the "public trust" is derived from a common law doctrine applicable to "navigable" waters within the State. The doctrine has its origins in the Northwest Ordinance of 1787, which declared the navigable rivers of the territory to be public highways for travel. Upon statehood, Michigan was given ownership of the Great Lakes and of the navigable waters, all subject to the right of navigation.

Early on in Michigan's history, conflicts developed between loggers and land owners over who had the right to use streams to float logs to market. The Michigan Supreme Court developed a log flotation test which relies upon use or capability of use for commercial logging as the basis for the test for navigability. The commercial logging test determines those waters impressed with the public trust since the public trust applies to navigable waters. The common law log flotation test continues to be the law today. In practice, determining which waters are navigable and impressed with the public trust on small isolated streams is often difficult. Later case law expanded the public trust to include the right to hunt and fish and, more recently, the right to walk Great Lakes beaches lakeward of the ordinary high water mark.

It is clear some of the streams to be crossed by the CR 595 route are navigable. Some of the smaller streams are more difficult to determine navigability. There are some streams that are proposed to be crossed by CR 595 that are clearly too small to meet the test of navigability: those are private streams with no public rights of use. The purpose of this application for permit is not to determine which streams are navigable and which are not. This application for permit seeks to build a road that involves stream crossings, some of which involve streams impressed with the public trust. In all cases this application for permit treats streams as though they are public and seeks to avoid any interference with potential public use.

The CR 595 application for permit is made under three separate statutes: The Wetlands Protection Act (Part 303 of the Michigan Environmental Protection Act ("NREPA"); Part 301 of NREPA (the Inland Lakes and Streams Act); and Part 31 of NREPA (Water Resource Protection). Parts 303 and 31 do not reference the public trust or implicate it as a permitting

commercial forest lands for recreation. Implementation of CR 595 will reduce logging truck traffic on CR 550.

3.08 Summary of Purpose and Need for CR 595

The purpose and need for the proposed CR 595 as demonstrated in this document is summarized in Table 3-8.

Table 3-8. Summary of Purpose and Need for CR 595.

Purpose for the Proposed CR 595	Need for the Proposed CR 595
Provide improved emergency services access to northwest Marquette County.	Present access for emergency services is inadequate and seasonal and has unacceptable response times due to the poor road conditions and distance of travel over circuitous routes from law enforcement, fire, and EMS stations.
Provide a primary county road access for a direct route to northwest Marquette County.	Presently the area is served by only one county road route (Triple A Road from CR 510) and Triple A Road is a seasonal, unimproved road. It is reasonable to assume that Triple A Road could be blocked during a severe weather event, forest fire, or other event that would block the road. CR 595 would provide a more reliable all-season road to serve as a primary access route.
Provide a primary county road to northwest Marquette County that is west of Silver Lake Basin.	Silver Lake Basin is the most upstream hydropower impoundment on the Dead River. In the event of a catastrophic event like 2003 that caused the failure of a bridge and dams, the route upstream of Silver Lake Basin would ensure a more secure access to the northwest part of Marquette County.
Provide a primary county road in a corridor that is needed for the desired spacing of all-season road transportation access in Marquette County.	Primary county roads are needed on a spacing of about eight miles to ensure reliable transportation network to all parts of the county.
Provide a shorter route and all-season paved road that is less costly than existing roads to maintain on an annual basis with limited public funds.	Using the existing CR 510-Triple A Road access to northwest Marquette County for heavy trucking without total reconstruction of these seasonal roads will cause constant maintenance problems to keep the roads in useable condition, including grading, dust control, snow removal, and erosion control. The length of the existing route and condition of the roads adds substantial maintenance cost compared to heavy truck and other traffic using CR 595 as the primary route.
Provide an all-season road that will serve to reduce heavy truck traffic in urbanized areas of Marquette County.	Heavy truck hauling through the City of Marquette, Marquette Township, Negaunee, and Ishpeming has been a matter of concern for many years. With the Eagle Development Project coming on line, the haulage issues are more important and the proposed CR 595 is a public necessity.
Provide improved access for the timber and mining industries in northwest Marquette County.	The timber industry is inadequately served by existing roads. Eagle Development Project requires all-season access to transport ore and people associated with the project.
Provide all-season access to northwest Marquette County.	Northwest Marquette County is inadequately served by Triple A Road which is seasonal and does not meet existing and future needs.
Provide an efficient travel route for commercial activities and the general public in northwest Marquette County.	Accidents increase proportionally with miles travelled. The proposed CR 595 is substantially shorter than the other routes and will provide a safer road for the travelling public.

4.0 ALTERNATIVES EVALUATED FOR THE PROPOSED PROJECT

The analysis of alternatives for CR 595 focuses on the available routes within, or near, the four-mile wide corridor recommended by the Marquette County Board of Commissioners and adopted by MCRC. However, as explained below, additional information from the assessment of a larger study area has been provided in this document to demonstrate and verify to the extent possible the purpose and need for CR 595. The MCRC CR 595 study corridor is shown in the preceding Figure 2-1 and is also shown in Figure 4-1. The larger study area (utilized in the project assessment conducted for KEMC in the evaluation of the alternatives that were considered for the Woodland Road project) is shown in Figure 4-2.

After the withdrawal of the Woodland Road application for permit by the Woodland Road LLC in May of 2010, KEMC and its contractors continued to evaluate potential alternative routes to serve the Eagle Development Project. KEMC initiated a comprehensive evaluation of the CR 510-Red Road-Sleepy Hollow and the CR 550 routes (Figure 4-2). The additional environmental and engineering studies conducted for the CR 510-Red Road-Sleepy Hollow and the CR 550 routes considered in the Woodland Road project are referenced in this document for comparative or informational purposes. The pertinent information gathered by KEMC during its extensive analysis of these routes is provided in Appendix N. These additional studies were initiated in June 2010 and were completed in March 2011.

The CR 510-Red Road-Gold Mine Lake Road and the CR 510-Red Road-Callahan Road routes were also evaluated after the withdrawal of the Woodland Road application for permit, but were determined by MDEQ and EPA to not be feasible and prudent (Appendix F).

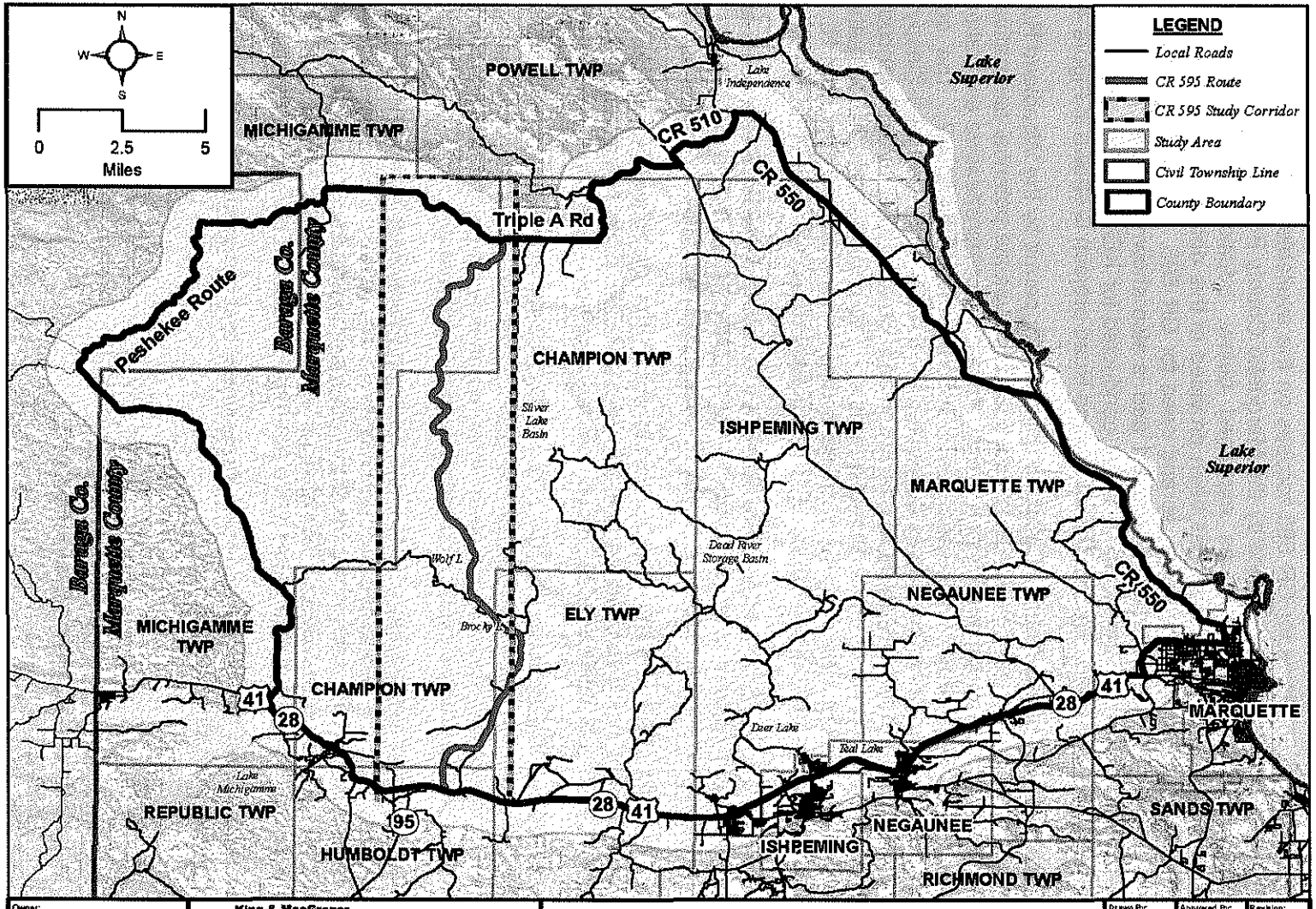
Although the CR 510 route that was evaluated during the Woodland Road application for permit review was not given further study for the CR 595 project assessment, it is also included in this document to provide a full presentation of the routes in the project study area.

Also included in this assessment for CR 595 are the Dishno and Peshekee routes (Figure 4-2). These routes are located west of the Silver Lake Basin and, as such, are located upstream of the dam system on the Dead River, which is an important consideration for the new primary county road as explained previously in this document.

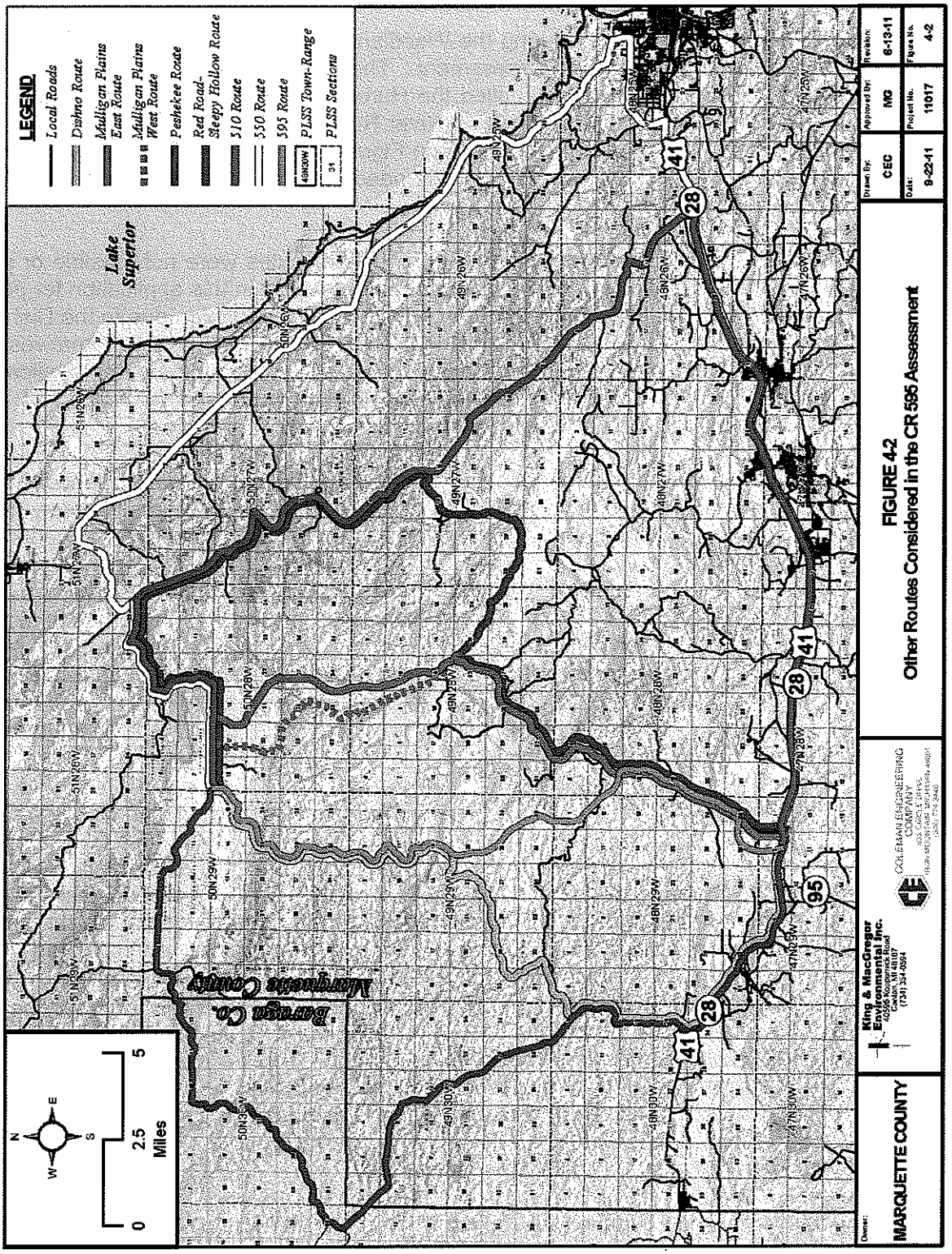
The Mulligan Plains West-Sleepy Hollow and Mulligan Plains East-Sleepy Hollow routes are also included in the CR 595 assessment (Figure 4-2). These routes are located downstream of the Silver Lake Basin, and do not meet the purpose and need for a primary county road upstream of the Silver Lake Basin. The Mulligan Plains West-Sleepy Hollow route has been further assessed to determine whether it is a potentially feasible or prudent alternative route.

The nine routes that are presented in this assessment that are predominantly outside of the four-mile wide road study corridor are:

- Dishno
- Peshekee
- Mulligan Plains East-Sleepy Hollow
- Mulligan Plains West-Sleepy Hollow
- CR 510
- CR 550
- CR 510-Red Road-Sleepy Hollow
- CR 510-Red Road-Gold Mine Lake Road
- CR 510-Red Road-Callahan Road



Owner: MARQUETTE COUNTY	King & MacGregor Environmental Inc. 40595 Koppernick Road Canton, MI 48187 (734) 354-0594	COLEMAN ENGINEERING COMPANY	FIGURE 4-1 Study Area	Drawn By: CEC	Approved By: MG	Revision: 6-10-11
				Date: 9-22-11	Project No. 11017	Figure No. 4-1



4.01 Evaluation of the Dishno and Peshekee Routes

Two routes that were evaluated during the Woodland Road application for permit were also considered in the CR 595 project assessment. These routes are the Dishno to Peshekee Grade Road (aka CR 607 and also called the Huron Bay Grade) to US-41 (Dishno route); and the Triple A Road west to West Huron River Road to Peshekee Grade Road to US-41 (Peshekee route). These routes are shown on Figure 4-2. These are the only two feasible routes other than CR 595 that would meet the need for a primary county road upstream of the Dead River dams.

Although MDEQ agreed that the Dishno and Peshekee routes were not feasible or prudent during the Woodland Road review, they have been presented in this application for permit to provide a full presentation of routes considered for CR 595. However, due to the Dishno and Peshekee routes not being feasible or prudent according to MCRC as alternatives to CR 595, further detailed studies were not conducted during the preparation of the application for permit for CR 595, other than the Dishno route field review and estimation of cost to construct performed by Coleman Engineering Company (CEC).

Wetland delineations were not done for the Dishno or Peshekee routes. Wetland impacts for these routes as described below were estimated using the Final Wetland Inventory from the Michigan Geographic Data Library. However, in 2011 CEC conducted a general field verification of wetlands along these routes to more accurately define the approximate extent of wetlands that may be impacted by these routes, if upgraded. Stream crossing impacts were calculated using the Michigan Geographic Hydrography Framework that was also obtained from the Michigan Geographic Data Library. Comparison of the Final Wetland Inventory to actual field wetland delineation on the routes where actual wetland delineations have taken place has consistently resulted in more actual wetlands than shown on the Final Wetland Inventory. As such, it is likely that the actual acreage of wetland impact for the Dishno and Peshekee routes would be higher than the acreage estimated.

4.01.A. Dishno Route

The Dishno route utilizes the portion of the proposed CR 595 from the intersection with Triple A Road south to the point where the Dishno Road enters Trail 5 north of Voelkers Creek. Thus, approximately the northern 9.5 miles of the Dishno route is the same as the proposed CR 595. The Dishno route is about 28 miles in length and would have an estimated 47 acres of wetland impact and 29 stream crossings with over 3,000 feet of existing roadway where a stream is located immediately adjacent to the side of the road. This route also has the potential for a substantial amount of stream relocation; for example, the Woodland Road AFP estimated 800 lineal feet of stream relocation on Dishno Creek. The reason for the stream relocation is the presence of a substantial rock outcrop directly adjacent to the existing Dishno Road where it is adjacent to the creek. It is likely that the stream relocation would have to be avoided, necessitating a substantial amount of rock cut (blasting), which would significantly raise the cost of construction of this route.

Utilizing this route would require the reconstruction of the entire route until its confluence with US-41. Widening and revised alignments of the road would be necessary, as determined by preliminary construction plans prepared by A. Lindberg & Sons, Inc. during the Woodland Road planning and as reviewed by CEC during the CR 595 planning.

The road reconstruction may be problematic due to the number of private property owners on this route compared to the proposed route and the presence of Van Riper State Park, through which part of the route is located. The number of land owners involved would likely make obtaining additional right-of-way easements or acquisition for this route very difficult, even considering that MCRC has the power of eminent domain (i.e. condemnation). If key property owners are not willing to provide easements or sell all/part of their property to allow reconstruction of the road, then route planning would be protracted and possibly contentious, both of which MCRC would like to avoid.

Another important consideration with the Dishno route is the length of the road that travels along the Dishno Creek and the Peshekee River. The road was historically located along the streams to take advantage of the flatter terrain. However, upgrading the existing road where the road parallels the streams is determined to be undesirable due to road runoff directly entering the streams, wetland impacts in close proximity to streams that could negatively impact aquatic habitat, and the potential for accidents given the predicted amount of trucking on the route, along with the other traffic expected on the road. Widening the road near streams would also significantly affect the feasibility of this route from a cost perspective due to the presence of bedrock ridges/outcrops in some locations directly adjacent to the existing roads.

The reconstructed road for this alternative would be within 100 feet of the Peshekee River for a total distance of about 13,050 feet in 10 different sections. The sections where the road and river are in this close proximity to each other vary in length from 100 feet to 4,000 feet. The road in this alternative would also be within 100 feet of the Dishno Creek for a total length of about 5,150 feet in eight segments varying in length from 100 feet to 2,200 feet. In total, the Dishno route would be within 100 feet of the Peshekee River and the Dishno Creek for a total of 18,200 feet, or almost 3.5 miles. The impacts to the streams and the aquatic life therein due to the road being in such close proximity is difficult to determine, but the noise, ground vibration, runoff of road salt, dust accumulation, emissions, and stormwater runoff are all likely to be negative effects.

As mentioned above, the Dishno route would either require the relocation of about 800 feet of the Dishno Creek or significant rock cuts in order to allow reconstruction of the road to provide a safe alignment. The presence of substantial areas of bedrock outcrops constrict the road design and necessitate either the stream being relocated or significant rock cuts in three areas in order to reconstruct the road. The estimated lengths of the three areas of potential stream relocations are 335 feet, 425 feet, and 40 feet. Stream relocations can be accomplished with minimal effects if done properly, but some impacts to fish and macroinvertebrates are unavoidable. Both the rock cuts and stream relocations are extremely expensive and would likely raise construction costs to make the route not feasible or prudent.

The Dishno route would not have the level of potential societal impacts associated with the CR 550 and CR 510-Red Road-Sleepy Hollow routes. Development in proximity to the existing road is relatively sparse. Although the Dishno route is approximately 32.5 miles shorter than the CR 550 alternative and approximately 13.3 miles shorter than the CR 510-Red Road-Sleepy Hollow route, there are significant undesirable effects to this route. The most significant detriments to the Dishno route are:

- The natural resources impacts, primarily to wetlands and streams, due to the reconstruction of the Dishno Road and Peshekee Grade Road would be more than other routes;

- Wetland impacts, estimated to be 47 acres, are the most of any available route (Peshekee is more wetland impact but is not available) and are approximately 21.4 acres more than the proposed CR 595 project;

- The number of stream crossings on the Dishno route (29) is more than the proposed CR 595 (22); the location of the Dishno Road and Peshekee Grade Road being within 100 feet of the Peshekee River and Dishno Creek for a distance of about 3.5 miles is a significant detriment; and,

- The need to either relocate about 800 feet of the Dishno Creek or perform significant rock cuts to allow the reconstruction of the road is an important consideration.

Although the Dishno route would provide a north-south access route to connect US-41 to northwest Marquette County, it would be about 6.1 miles longer than the proposed CR 595. More importantly, the intersection with US-41 would be about 3.5 miles further west than the proposed CR 595 intersection with US-41. This lengthens the route for emergency vehicles coming from Ishpeming (e.g. MDNR fire and Bell EMS) responding to northwest Marquette County. The south terminus of the Dishno route with US-41 moves the road too far west to be within the corridor where a new primary county road has been determined to be needed. It is an inefficient and more costly route.

For the reasons stated in the preceding paragraphs, the Dishno route is not feasible or prudent when compared to the proposed CR 595.

4.01.B. Peshekee Route

The Dishno route is the only route available entirely within Marquette County that is located west of the proposed CR 595. However, the Peshekee route was considered even though it extends into Baraga County (Figure 4-2).

The Peshekee route analysis was performed comparable to the analysis conducted for the Dishno route. The Peshekee route is 38.5 miles in length. The wetland impacts for the Peshekee route are estimated to be 68 acres, with an estimated 25 stream crossings. It should also be noted that a majority of the stream impacts on the Peshekee route would be major structures, including seven crossings of the Peshekee River.

Inquiries were made by MCRC to the Baraga County Road Commission (BCRC) about utilizing the Peshekee route. BCRC noted that the road improvements that would be made in Baraga County as a result of the Peshekee route being implemented would not have any physical connection with their existing public road system. It was also noted that significant improvements would have to be made, and right-of-way would have to be obtained to connect this road to the Baraga County road system. These factors make this improvement less than ideal for BCRC. Regardless of the BCRC position, there are also significant detriments to this route, as listed below.

- The Peshekee route, with an estimated 68 acres of wetland impact, is about 42.4 acres more wetland impact than the proposed CR 595;

- The route has three more stream crossing than the proposed CR 595 and involves larger streams;

- The Peshekee route is about 17.1 miles longer than the proposed CR 595 route. The additional road length is not prudent for the MCRC due to the additional construction and maintenance costs.

For these reasons listed above, the Peshekee route is not a feasible or prudent alternative and, in fact, is not desirable because of the disconnect with BCRC's existing public road system.

4.02 Mulligan Plains East-Sleepy Hollow Route and Mulligan Plains West-Sleepy Hollow Route

The Mulligan Plains East and West routes were given preliminary consideration as potential alternatives to the proposed CR 595 route. Due to the potential of these routes to meet the purpose and need for CR 595, the discussion of these routes is included in Section 4.04.K.

4.03 Evaluation of the CR 550 and CR 510 Routes

The other routes that were evaluated as part of the preparation of the application for permit for CR 595 were CR 550 as well as three "CR 510-Red Road" routes: CR 510-Red Road-Sleepy Hollow, CR 510-Red Road-Gold Mine Lake Road, and CR 510-Red Road-Callahan Road.

The CR 550 route has been fully evaluated in a manner similar to the proposed CR 595 route. With respect to the CR 510-Red Road routes, during meetings with MDEQ and EPA following the withdrawal of the application for Woodland Road in May 2010, there were discussions regarding the alternatives that needed to be provided by the applicant in any subsequent application. MDEQ and EPA expressed the need to specifically have the use of the Red Road evaluated in order to determine if one of the several potential routes involving Red Road could be feasible and prudent for the project purpose of Woodland Road. The Red Road route considered for this purpose begins at the north terminus of the project, which is located at the Trail 5-Triple A Road intersection and proceeds easterly on Triple A Road to County Road 510, then southerly to Red Road, then generally westerly until the road crosses the AAO Road bridge over the Dead River. South of the Dead River, three alternative routes for the Red Road were considered, as recommended by MDEQ and EPA. These routes are shown in the document in Appendix E.

One of the three CR 510-Red Road routes, the Triple A Road to CR 510 to Red Road to Sleepy Hollow to Wolf Lake Road to US-41 route (CR 510-Red Road-Sleepy Hollow route) was evaluated in detail by conducting wetland delineations, stream surveys, and preliminary engineering design in order to allow an accurate and generally equal comparison to the proposed CR 595. Sub-alternatives for the CR 510-Red Road-Sleepy Hollow route to minimize wetland impacts and alignment issues were included in the evaluation, as described in this document.

The CR 510-Red Road-Sleepy Hollow route was originally designed to go south from the intersection of Sleepy Hollow Road and Wolf Lake Road, with a reroute to the east of Brocky Lake across what has been termed the "porcupine wetland". The wetland and stream impacts for the CR 510-Red Road-Sleepy Hollow route that are discussed in this document are for this route. If the Sleepy Hollow Road route is implemented for this project, then the location of the southern portion of this route (i.e. to either go westerly to the Kipple Creek reroute west of Brocky Lake or to utilize the original route east of Brocky Lake) will have to be decided.

The other CR 510-Red Road alternative routes, i.e. the Gold Mine Lake Road route and the Callahan Road route, were evaluated using a more cursory evaluation in concurrence with MDEQ and EPA guidance. A report (Appendix E) addressing these routes was submitted to MDEQ for review in the fall of 2010. In a response letter dated November 18, 2010 MDEQ and EPA stated, "...the Sleepy Hollow route appears to be the best of the alternatives included with this evaluation..." (Appendix F). Gold Mine Lake Road and Callahan Road routes were not feasible due to various issues with these routes; primarily land ownership, proximity to a large number of private residences, and environmental concerns such as more potential impacts to wetland resources as compared to the Sleepy Hollow route.

With the advent of MCRC proposing a new primary county road (CR 595) in October 2010, the evaluation of the CR 510-Red Road-Sleepy Hollow route and the CR 550 route did not meet the project purpose and did not fulfill the purpose and need for a new primary county road. However, the results of the extensive amount of work conducted to evaluate these other routes (e.g. various detailed ecological studies, wetland delineation, stream evaluation, and detailed road design engineering plans, etc.) are included in Appendix N of this document for informational purposes and additional discussion is provided in the following sections.

4.03.A. CR 550

In addition to the CR 510-Red Road-Sleepy Hollow route, the CR 550 route has also been fully evaluated in a manner similar to the proposed CR 595 route. The CR 550 route includes a segment of Triple A Road and CR 510. The Triple A Road segment is also common to the CR 510-Red Road-Sleepy Hollow route. CR 510 is utilized from the intersection with Triple A Road north to CR 550.

The CR 550 route is approximately 60 miles in length as measured from the north terminus at the intersection of Trail 5 and Triple A Road to the south terminus at CR FY and US-41. The CR 550 route has only about one acre of wetland impact associated with upgrading the existing roadway, and would require the reconstruction of four existing stream crossings. In addition, a portion of the Triple A Road may be relocated and the three existing crossings of the East Branch Salmon Trout River may be replaced with one new crossing if this route is implemented.

MCRC believes that the CR 550 route is not a feasible and prudent alternative route to the proposed CR 595 and is therefore considered a "no-build" route for the following reasons:

- Although the natural resources impacts are the lowest of all routes, the CR 550 route has significant societal issues related to heavy truck travel. There is substantial public and local governmental opposition to upgrading CR 550 as a truck travel route.

- The CR 550 route is 37.5 miles longer than the proposed CR 595 and is not located in the area where the need for a new primary county road has been determined by the Marquette County Board of Commissioners and MCRC.

- CR 550 would not substantially meet the purpose and need for the proposed CR 595 for a new primary county road as explained in this document, including improving emergency services access, providing a second access route that is upstream of the Dead River dam system, improving recreational access, and improving efficiency of access for large acreage of timber company land holdings in northwest Marquette County.

4.03.B. CR 510-Red Road-Sleepy Hollow

The CR 510-Red Road-Sleepy Hollow route includes a segment of Triple A Road and CR 510. CR 510 is utilized from its intersection with Triple A Road south to Red Road, a distance of 11 miles. The route continues on Red Road along the north side of part of the Hoist Basin to Sleepy Hollow Road, generally westerly to Wolf Lake Road, and south to US-41 on the proposed CR 595 route. The CR 510-Red Road-Sleepy Hollow route is 41.3 miles in length and would have about 13.04 acres of wetland impact and 35 stream crossings. There would be significant stream relocations in portions of the route and relocation of the road in an area of steep terrain and bedrock outcrops in the vicinity of what is commonly called "the hairpin" curve required for the construction of this route, which would add substantial cost to construction of this alternative.

The CR 510-Red Road-Sleepy Hollow route is 19.9 miles longer than the proposed CR 595 route and is not located in the area where the Marquette County Board of Commissioners or MCRC have determined the necessity for a new primary county road. These governmental agencies, along with verification of the need by MDOT and FWHA, are responsible for determining the transportation needs of Marquette County.

CR 510-Red Road-Sleepy Hollow route does not meet the purpose and need for the proposed CR 595 and is therefore is considered to be a "no build" alternative by MCRC for the following reasons:

- The route is in close proximity to CR 550 (i.e. from 3 to 5 miles) down to the point where Red Road intersects with CR 510. To have two paved primary county roads (CR 510 is not paved) in this relatively undeveloped part of Marquette County is not prudent or necessary to serve the transportation needs of the county. The geographical service area where MCRC has determined the need for a new primary county road would remain without suitable county road service.

- The route is 41.3 miles in length, which is 19.9 miles longer than the proposed CR 595 (21.4 miles). For MCRC to maintain this excess length of primary county road through relatively undeveloped country is not prudent, given the tight road maintenance budget that MCRC has to operate under.

- The CR 510-Red Road-Sleepy Hollow route is almost twice as long a route as CR 595. As such, the cost to construct the CR 510-Red Road-Sleepy Hollow route would

likely to be approximately twice as much as CR 595, without the same benefits as CR 595.

- The CR 510-Red Road-Sleepy Hollow route would not substantially meet the purpose and need for a new primary county road as explained in this document, including improving emergency services access, providing a second access route that is upstream of the Dead River dam system, improving recreational access, and improving efficiency of access for large acreage of timber company land holdings.

4.03.C. Summary of MCRC Position on Other Routes

The Dishno, CR 550, and CR 510-Red Road-Sleepy Hollow routes are considered by MCRC to be "no-build" alternatives. The term "no-build" alternative in this application for permit refers to the MCRC analysis and its finding that improvements to existing roads would not meet the purpose and need for the proposed CR 595 as explained in this document. If existing roads are considered for improvement and CR 595 is not constructed, the needs for a new road remain.

In regard to the Eagle Development Project, the only alternatives for mine access and a haul route for ore to be transported to Humboldt Mill are CR 550 through Marquette and CR 510 to US-41 in Negaunee Township. Use of either of both of these routes by KEMC would require many more truck trips, as these routes are not entirely all-season roads and lighter loads would be required during the spring breakup period, which usually lasts about two months.

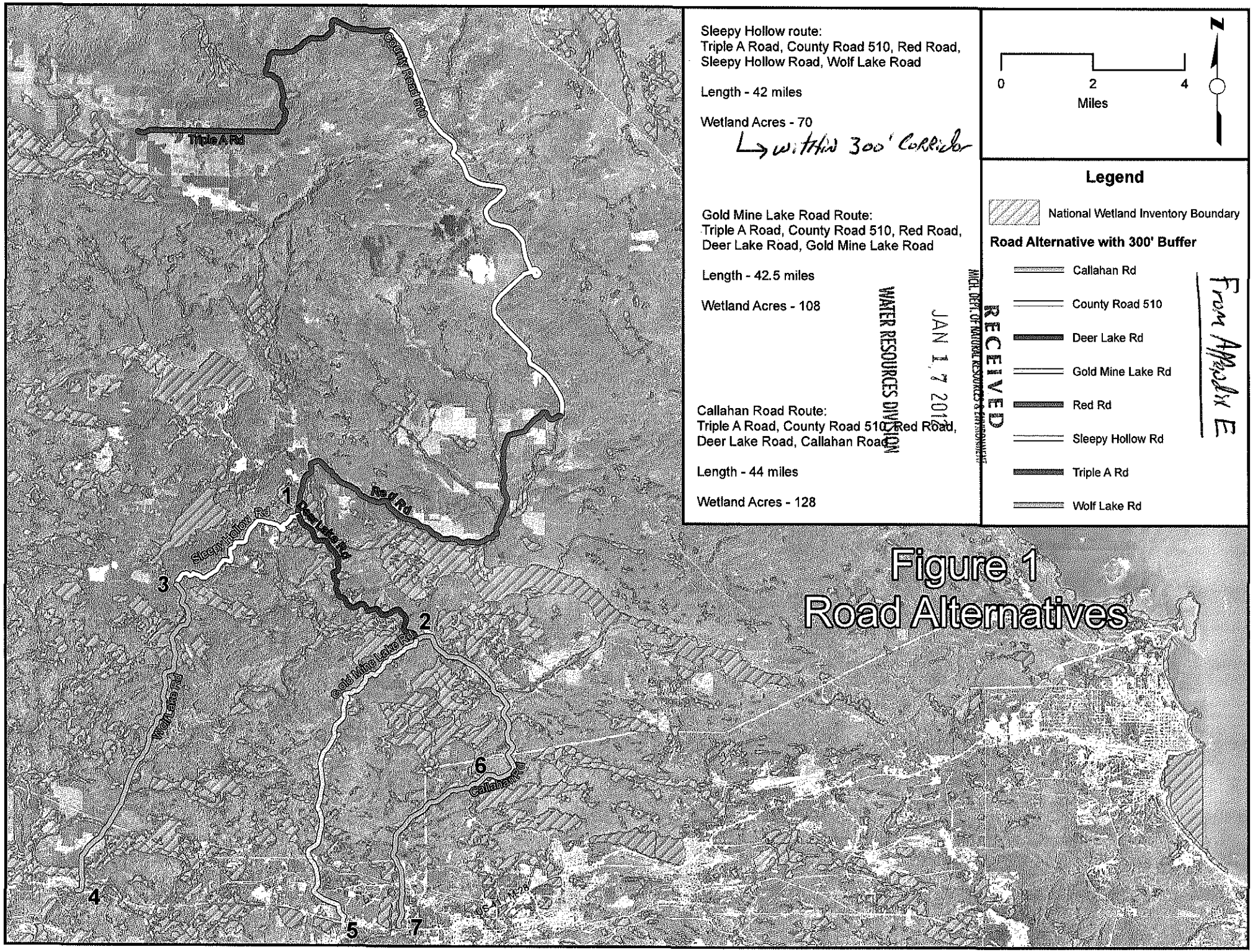
The timber industry likewise will have no option but to continue to utilize existing routes, many of which are unimproved roads. The opportunity for the timber industry to benefit from the more efficient and reliable all-season access provided by CR 595 would not be realized if existing routes must be used. Excess fuel usage, greenhouse gas emissions, and wear and tear on trucks and other vehicles would be manifested for the timber industry also if CR 595 is not allowed.

Emergency services, public safety, and recreational access to northwest Marquette County would also not be improved if CR 595 is not permitted. Existing routes will not meet the needs expressed in this document for upgrading access for emergency services in the County by EMS, law enforcement, and firefighting agencies.

The excess fuel usage and increased greenhouse gas emissions that would result from using existing routes over time just for the users described above could be minimized by construction of CR 595. In these times of rising fuel costs and public health concerns regarding greenhouse gas emissions identified by EPA, any action that reduces fuel consumption and greenhouse gas emissions should be favorably received. As such, implementation of any of the no-build alternatives would actually result in net negative impacts to air quality as compared to the CR 595 project.

4.04 Evaluation of the Alternatives within the CR 595 Road Study Corridor

Twenty alternative segments that either are within the four-mile wide by 21.4-mile long road study corridor, or those that are adjacent to the study corridor, were evaluated to determine the location for CR 595 that reduces impacts on wetlands and streams to the greatest extent



Sleepy Hollow route:
Triple A Road, County Road 510, Red Road, Sleepy Hollow Road, Wolf Lake Road

Length - 42 miles

Wetland Acres - 70
↳ within 300' Corridor

Gold Mine Lake Road Route:
Triple A Road, County Road 510, Red Road, Deer Lake Road, Gold Mine Lake Road

Length - 42.5 miles

Wetland Acres - 108

Callahan Road Route:
Triple A Road, County Road 510, Red Road, Deer Lake Road, Callahan Road

Length - 44 miles

Wetland Acres - 128

RECEIVED
MICH. DEPT. OF NATURAL RESOURCES & ENVIRONMENT
JAN 17 2012
WATER RESOURCES DIVISION

N

0 2 4
Miles

Legend

National Wetland Inventory Boundary

Road Alternative with 300' Buffer

- Callahan Rd
- County Road 510
- Deer Lake Rd
- Gold Mine Lake Rd
- Red Rd
- Sleepy Hollow Rd
- Triple A Rd
- Wolf Lake Rd

From Appendix E

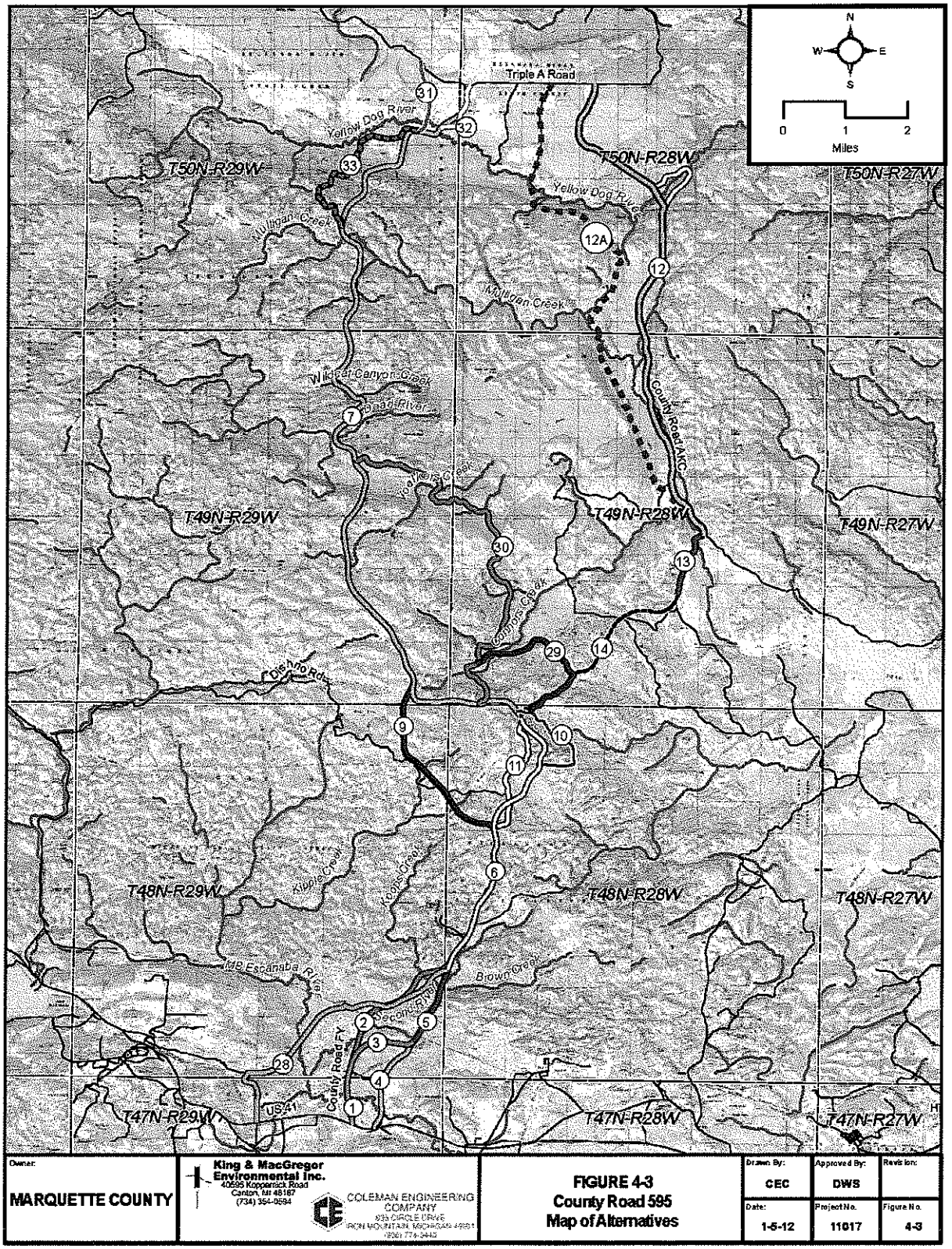
Figure 1
Road Alternatives

practical. These 20 alternative segments are shown on Figure 4-3 and are described in Table 4-1. Note that the alternative segments are not all numbered consecutively in order to avoid confusion with the numbering system that was previously used by the project team over the past months to identify various alternative segments. The segments omitted (Segments 8 and 15-28) are not included in this document because these segments were determined to not meet the project purpose for CR 595.

Table 4-1. Alternative Segments Evaluated for CR 595 Route within the Study Corridor (Revised 1/6/12).

Segment Number	Segment Alternative	Alternative Description
1	CR FY	From US-41 on CR FY and the north extension of CR FY to Wasie Cutoff.
2	Wasie Cutoff to CR AAD	From Wasie Cutoff on CR FY north across Second River and Koops Creek to CR AAD and Wolf Lake Road intersection.
3	Wasie Cutoff	From the north extension of CR FY then east through Wasie property to Wolf Lake Road.
4	Wolf Lake Road South	From US-41 north on Wolf Lake Road to Wasie Cutoff.
5	Wolf Lake Road	Wolf Lake Road from Wasie Cutoff to CR AAD intersection.
6	Wolf Lake Road North	Wolf Lake Road from CR AAD intersection to Sleepy Hollow Road (uses the "porcupine" reroute east around Brocky Lake)
7	Wolf Lake Road/Trail 5	On Wolf Lake Road and Trail 5 from Sleepy Hollow Road to Triple A Road
9	Kipple Creek Reroute	From Wolf Lake Road south and west around Brocky Lake to Trail 5 northeast of Wolf Lake.
10	Brocky Lake East Bypass	From Wolf Lake Road east of Brocky Lake around to the east and north back to Wolf Lake Road.
11	Brocky Lake Road	From just south of the Dishno Road intersection south of Brocky Lake, north on a private road section of what is locally called Wolf Lake Road past the camps on the east side of Brocky Lake.
12	Mulligan Plains East	From Red Road just north of the CR AAO bridge westerly to the Mulligan Plains Truck Trail and northerly across the Yellow Dog River to Triple A Road.
12A	Mulligan Plains West	Generally the same as above, but with a westerly route across the Yellow Dog River.
13	Red Road-Dead River	From Sleepy Hollow Road northerly on Red Road (CR AAO) to just north of the AAO Bridge over the Dead River.
14	Sleepy Hollow	From Wolf Lake Road just north of Brocky Lake on Sleepy Hollow Road then easterly to Red Road (CR AAO).
28	Clowry-Dyno Nobel	From US-41 north on CR FN then on an abandoned railroad grade to CR AAD then east to Wolf Lake Road.
29	Grapevine Road East Bypass	From Wolf Lake Road north of Brocky Lake around to the east, then north and back west to intersect with the Grapevine Alternate segment.
30	Grapevine Road	From Wolf Lake Road north of Brocky Lake northerly and then westerly back to Trail 5 snowmobile trail west of Silver Lake Basin.
31	West Yellow Dog River Crossing	From Trail 5 just south of the Yellow Dog River north across the Yellow Dog River at a new crossing location about 400' upstream of the existing bridge to Triple A Road.
32	Yellow Dog River North	From just north of the Yellow Dog River at the present bridge location on Trail 5, then easterly and then northerly to Triple A Road.
33	North Slope Trail 5	From north of Mulligan Creek on Trail 5 to the Yellow Dog plains ending just westerly of the existing bridge over the Yellow Dog River.

The characteristics and findings regarding each of the 20 alternative segments for the location of the proposed CR 595 within the four-mile wide study corridor are presented in the following sections.



Owner:					
MARQUETTE COUNTY	King & MacGregor Environmental Inc. 40595 Koppernick Road Canton, MI 48187 (734) 354-9594	COLEMAN ENGINEERING COMPANY 939 CIRCLE DRIVE IRON MOUNTAIN, MICHIGAN 49801 (906) 774-2442	FIGURE 4-3 County Road 595 Map of Alternatives	Drawn By: CEC	Approved By: DWS
				Date: 1-5-12	Project No. 11017
				Revision:	Figure No. 4-3

4.04.A. Alternative Segment 1. CR FY

The CR FY alternative segment begins at the intersection of CR FY and US-41 and proceeds northerly to the end of CR FY and then continues north across the Middle Branch Escanaba River to the Wasie Cutoff. The proposed road would be entirely within the right-of-way of CR FY where it passes through the Humboldt Wetland Mitigation Bank property. This road segment is 1.02 miles in length.

Alternative Segment 1 Wetland Impacts

Wetland impacts for the CR FY alternative segment have been determined to be 1.31 acres.

Alternative Segment 1 Stream Impacts

There is one stream crossing on the CR FY alternative; a new clear-span bridge over the Middle Branch Escanaba River is proposed.

4.04.B. Alternative Segment 2. Wasie Cutoff to CR AAD

This segment extends from the Wasie Cutoff on the extended CR FY north across Second River and Koops Creek to CR AAD and Wolf Lake Road intersection (this was the proposed Woodland Road route). This alternative segment is 2.5 miles in length.

Alternative Segment 2 Wetland Impacts

Wetland impacts for Alternative Segment 2 have been determined to be 1.35 acres.

Alternative Segment 2 Stream Impacts

Stream impacts in this alternative segment involve two new stream crossings; one over Second River and one over Koops Creek. The Second River crossing would involve substantial wetland fill. The Second River crossing would be a clear-span box beam bridge and the Koops Creek crossing would be a Conspan® bridge and is at a place where the stream often dries up during the summer.

4.04.C. Alternative Segment 3. Wasie Cutoff

This segment extends from the north extension of CR FY east through the Wasie property to Wolf Lake Road. This alternative segment was investigated for the purpose of avoiding the wetland and stream impacts associated with Alternative Segment 2 across Second River and Koops Creek and also to avoid the impacts to the residential area along Wolf Lake Road just north of US-41. The length of the Wasie Cutoff segment is 1.25 miles.

Alternative Segment 3 Wetland Impacts

There are no wetland impacts for the Wasie Cutoff alternative segment.

Alternative Segment 3 Stream Impacts

There are no stream impacts for the Wasie Cutoff alternative segment.

4.04.D. Alternative Segment 4. Wolf Lake Road South

The Wolf Lake Road South (WLRS) alternative segment would begin at the intersection of US-41 and Wolf Lake Road and proceed north on a realignment needed to provide a US-41 intersection design acceptable to MDOT. The realignment would be through a portion of the Humboldt Wetland Preserve property that is not in a Conservation Easement and then back onto the existing Wolf Lake Road south of the Middle Branch Escanaba River. The segment on Wolf Lake Road continues north to a point where the Wasie Cutoff alternate segment intersects Wolf Lake Road. The Wolf Lake Road South alternative segment is 1.7 miles in length.

Alternative Segment 4 Wetland Impacts

Wetland impacts for the WLRS alternative segment have been determined to be 1.55 acres.

Alternative Segment 4 Stream Impacts

The WLRS segment would require the construction of a new bridge over the Middle Branch Escanaba River. Due to the relatively sharp curve in Wolf Lake Road at the river crossing, the alternative alignment would need to be just upstream (west) of the existing bridge to provide a better horizontal alignment of the road. Also, the need to keep the road open to traffic during construction makes the new bridge location a requirement. Two culvert replacements would be required at existing stream crossings of tributaries to the Middle Branch Escanaba River.

4.04.E. Alternative Segment 5. Wolf Lake Road

The Wolf Lake Road alternative segment begins at the intersection of Wolf Lake Road with the Wasie Cutoff segment and extends northerly on Wolf Lake Road to the intersection with CR AAD. This section of Wolf Lake Road is gravel surface. The road crosses Second River in this segment. The length of the Wolf Lake Road alternative segment is 1.3 miles in length.

Alternative Segment 5 Wetland Impacts

Wetland impacts for the Wolf Lake Road alternative segment have been determined to be 4.14 acres.

Alternative Segment 5 Stream Impacts

The Wolf Lake Road alternative segment would require the reconstruction of the existing Wolf Lake Road crossing of Second River, including a realignment of the existing roadway. Presently Wolf Lake Road is located either directly adjacent to Second River or is within a very close distance to the river for a distance of about one mile. The maintenance and operation of the road is assumed to have impacts on Second River and the aquatic organisms in the river. This alternative segment would relocate about 875 feet of Wolf Lake Road further from Second River.

4.04.F. Alternative Segment 6. Wolf Lake Road North

This segment is Wolf Lake Road from CR AAD to Sleepy Hollow Road, using a proposed reroute east around Brocky Lake camps. Wolf Lake Road as a county road ends just south of Brocky Lake at/near the Dishno Road intersection, but the road continues as a private road northerly past Brocky Lake to Wolf Lake and is literally in the back yard of some camps on Brocky Lake. The intent of the reroute to the east of Brocky Lake was to minimize direct and indirect impacts from the proposed CR 595 on the landowners on Brocky Lake. Alternative Segment 11 has more explanation about the existing road. The Wolf Lake Road North segment is 4.7 miles in length.

Alternative Segment 6 Wetland Impacts

Wetland impacts for the Wolf Lake Road North alternative segment have been determined to be 6.40 acres.

Alternative Segment 6 Stream Impacts

The Wolf Lake Road North alternative segment would require a new stream crossing over a tributary to Barnhardt Creek at the outlet of what has been called the "Porcupine Swamp". A 53-foot long clear-span box beam bridge would be proposed at that location to minimize indirect impacts on the wetland groundwater hydrology and allow free passage of wildlife in the wetland. Four other stream crossings would also be required on this route segment.

4.04.G. Alternative Segment 7. Wolf Lake Road/Trail 5

This segment is Wolf Lake Road (as locally called but not a designated county road at this location) from Sleepy Hollow to near Wolf Lake where Trail 5 then courses northerly to Triple A Road. This segment is a combination of existing roads, logging roads, and new routes on the best alignment as discerned by field surveys and evaluation conducted over several years. The Wolf Lake Road/Trail 5 alternative segment is 14.4 miles in length.

Alternative Segment 7 Wetland Impacts

Wetland impacts for the Wolf Lake Road/Trail 5 alternative segment have been determined to be 15.59 acres.

Alternative Segment 7 Stream Impacts

There are 16 stream crossings proposed in the Wolf Lake Road/Trail 5 alternative segment. Only one of the major stream crossings is a new crossing location (Mulligan Creek).

4.04.H. Alternative Segment 9. Kipple Creek Reroute

The Kipple Creek Reroute segment extends from Wolf Lake Road south of the Dishno Road intersection west and north around Brocky Lake to Trail 5 just east of Wolf Lake. This segment was investigated during the application preparation for the Woodland Road as a potential route around Brocky Lake to minimize direct and indirect impacts to camps in that area. The segment is not located entirely on existing roads or trails.

During the public information meetings held by the MCRC on August 30 and 31, 2011, some landowners from the Brocky Lake area expressed a desire to have the proposed CR 595 located west of Brocky Lake. As a result, MCRC authorized the investigation of the potential route with road alignment changes to provide a safe road design and wetland delineation and stream surveys conducted to determine the natural resources impacts. The revised Kipple Creek Reroute segment is 3.4 miles in length.

Alternative Segment 9 Wetland Impacts

Wetland impacts for the revised Kipple Creek Reroute alternative segment have been determined to be 4.50 acres.

Alternative Segment 9 Stream Impacts

The Kipple Creek segment involves four stream crossings; three unnamed tributaries to Kipple Creek and the main stem of Kipple Creek. All of these crossings will be new.

4.04.I. Alternative Segment 10. Brocky Lake East Bypass

The Brocky Lake East Bypass segment is an eastward loop from the proposed CR 595 route east of Brocky Lake and terminates on what is locally called Wolf Lake Road north of Brocky Lake (although the actual county road ends south of Brocky Lake). This segment was evaluated for the purpose of trying to locate a route around areas of steep topography. The Brocky Lake East Bypass segment would move the road location further east and would be located around the base of the hill to reduce grade change in this road location. However, the East Bypass segment was determined to have more horizontal and vertical alignment issues than the proposed CR 595 route and was therefore not selected as the best alternative segment. The East Bypass reroute segment would add 1.2 miles to the route.

Alternative Segment 10 Wetland Impacts

Wetland impacts for the Brocky Lake East Bypass alternative segment have been determined to be 4.30 acres.

Alternative Segment 10 Stream Impacts

There are no stream crossings on the Brocky Lake East Bypass segment.

4.04.J. Alternative Segment 11. Brocky Lake Camps Access Road

The existing segment on what is termed for this document as "Brocky Lake Camps Access Road" (a segment of what is locally called Wolf Lake Road and is located on the east side of Brocky Lake) was evaluated as an alternative segment for this portion of the proposed CR 595. The existing Wolf Lake Road that is a public road ends just south of Brocky Lake at the Dishno Road intersection. The road that continues northerly to Wolf Lake is locally called Wolf Lake Road but the portion of the road along the east side of Brocky Lake is a private road with seven separate parcel owners. Prior contacts with these property owners resulted in one property owner refusing to consider any agreement that would allow Brocky Lake Road to be reconstructed, which at that time was part of the proposed Woodland Road. Due to the fact that permission from the private property owners that own the road is necessary to

utilize this alternative segment unless condemnation is invoked, the alternative segment is not available and was not given further consideration. In addition, the direct and indirect impacts to these property owners on Brocky Lake from a new road is not desirable and can be avoided or minimized with an alternate road location.

Alternative Segment 11 Wetland and Stream Impacts

Due to the lack of feasibility for this alternative segment, the wetland and stream impacts were not determined.

4.04.K. Alternative Segment 12. Mulligan Plains East and Alternative Segment 12A. Mulligan Plains West

Although the Mulligan Plains Segments 12 and 12A extend beyond the road study corridor, they were evaluated in order to determine whether these segments would be acceptable alternative segments for CR 595. The Mulligan Plains East alternative segment is 9.5 miles in length. As shown in Figure 4-2, the segment that would include the Mulligan Plains East alternative begins at the intersection of Wolf Lake Road and US-41, continues to the intersection of Sleepy Hollow Road and Wolf Lake Road, then to Sleepy Hollow Road to Red Road, then north on Red Road across the AAO Bridge over the Dead River, then westerly across Mulligan Creek and then generally northerly through the Mulligan Plains and across the Yellow Dog River to Triple A Road. The Red Road-Dead River and Sleepy Hollow Road alternative segments that are part of this segment are explained in the following sections (i.e. 4.4.L and 4.4.M).

The substantial difficulty with the Mulligan Plains East alternative segment would be an extremely difficult crossing of the Yellow Dog River, requiring a significant amount of bedrock cut and fill over a very deep gorge (i.e. over 200 feet). Such a crossing renders this alternative to not be prudent.

Alternative Segment 12 Wetland and Stream Impacts

The wetland impacts have been estimated for the Mulligan Plains East segment to be about 25.20 acres and stream crossings estimated at 12. Wetland delineation has not been conducted for this segment. Preliminary engineering evaluations have been conducted regarding the crossing location on the Yellow Dog River to determine feasibility and estimated cost for the bridge over the deep gorge.

Alternative Segment 12A, Mulligan Plains West

The Mulligan Plains West Segment 12A would cross the Yellow Dog River about 1.5 miles upstream of Pinnacle Falls. The river crossing would not appear to be a significant issue because there is no deep gorge at this location, but the road segment would pass through an existing Conservation Easement held by The Nature Conservancy. This segment would require a modification of the Conservation Easement to allow the construction of the road.

The Mulligan Plains West Segment 12A evaluation was initiated in September 2011 with preliminary engineering evaluations performed to locate a suitable road alignment. Wetland delineation, stream assessments, MiRAM evaluation, preliminary field surveying, and aerial

topographic mapping were also conducted to obtain information for engineering design. Preliminary engineering of the Mulligan Plains West route has not been completed.

The Mulligan Plains West route meets the project purpose, as indicated in Table 4-3 of the October 6, 2011 AA/PA, however having the new road upstream of Silver Lake Basin to ensure road access during a flood event on the Dead River is a critical road location factor as documented in the Purpose and Need for CR 595 in section 3.0 of the AA/PA. An excellent description of the damage caused by the 2003 Silver Lake Basin berm failure and resultant flood on the Dead River and the public safety, environmental, and economic impacts from the flood was presented by U.S. Senator Carl Levin to the U.S. Senate on September 16, 2003. A copy of Senator Levin's address is provided in Appendix I. Photographs of the washout of the bridge over the Dead River on CR AAO and the washout of the bridge on CR AAT over the Mulligan Creek are provided in Appendix K to depict the power of the flood in 2003.

Being upstream of the uppermost dam on the Dead River is important, but two other factors weigh in against the Mulligan Plains West route. These other two factors are: 1) the route traverses through nearly one mile of a Conservation Easement held by The Nature Conservancy (Appendix O) near and along the Yellow Dog River where the Mulligan Plains West route would have to be located; and, 2) the fact that the road for this route would be located in close proximity (parallel) to the Yellow Dog River for a distance of about one mile. A map is provided in Appendix O that depicts the location of the proposed CR 595, the Mulligan Plains West route, and the location of the Conservation Easement.

The Recitals in the Conservation Easement held by The Nature Conservancy provide some explanation of the natural values of the property. Recital B, Conservation Values, states, in part, *"The Protected Property, in its present state, has significant natural, aesthetic, scientific and educational values as a "relatively natural habitat of fish, wildlife, or plants or similar ecosystem," .....These values are of great importance to the Grantor, to the people of Marquette County, Champion Township, and the people of the State of Michigan."* Recital B goes on to state, *"Over 12 rare plant species have been found in the area including several state rare species of grape ferns or moonworts (Botrychium) on the specific property to be placed under easement."*

On page two of the Conservation Easement, under the Grant of Conservation Easement, item 1 in the Purpose states, *"It is the purpose of this Easement to assure that the Protected Property will be retained forever substantially undisturbed in its natural, scenic, and wild condition and to prevent any use of the Protected Property that will significantly impair or interfere with the Conservation Values of the Protected Property ("Purpose"). Grantor intends that this Easement will confine the use of the Protected Property to activities that are consistent with the Purpose of this Easement."* Roads are listed in the Prohibited Uses/Restrictions on page 2 of the Conservation Easement.

Although the Conservation Easement recognizes on page 9 that the Easement may be extinguished by certain actions (*"....if the restrictions of this Easement are extinguished by judicial proceedings (including, but not limited to, eminent domain proceedings)...."*). MCRC is opposed to initiating eminent domain (i.e. condemnation) proceedings to construct a primary county road on the property within the Conservation Easement. The likely public opposition to such proceedings, and the negative publicity that would result to both MCRC and MDEQ, would likely be substantial.

The importance of having the proposed road upstream of the Dead River dam system cannot be over-emphasized. Admittedly a flood event like that which occurred in May 2003 is a rare event, but dams are not fail-safe and failures are not uncommon. Having a community (Big Bay), county residents, businesses, and a major mining facility isolated from emergency services, law enforcement, access to work, and critical supplies is a significant public concern. The proposed CR 595 would provide a reliable access route during a flood event or other natural catastrophic event. As long as significant private funding is available to build the proposed CR 595, it is prudent to build it in a location that would provide reliable access above the dam system.

The decision to locate the road above the Dead River dam system is a community decision and was based upon public hearings, public meetings, resolutions of local governmental agencies, including the Marquette County Board of Commissioners and Marquette County Road Commission. These agencies are assigned the responsibility to determine the need for county road locations and they followed a public process in making their decisions.

It is the applicant's position, for the reasons stated in the preceding response, that the Mulligan Plains West alternative route meets the project purpose, is feasible to construct, but is not prudent.

Alternative Segment 12A Wetland and Stream Impacts

The wetland impacts for Alternative Segment 12A have not yet been determined, but are estimated to be about 12 acres for the entire route from US-41 to Triple A Road. Preliminary engineering design must be completed in order to determine the wetland impacts and stream crossings for this segment.

4.04.L. Alternative Segment 13. Red Road-Dead River

This alternative segment is the second segment of the Mulligan Plains segments presented above. The Red Road-Dead River alternative segment begins at the intersection of Sleepy Hollow Road and Red Road, then north on Red Road to just north of the AAO Bridge over the Dead River. At this point, the Mulligan Plains Alternative Segments 12 and 12A begin.

The Red Road-Dead River segment is located on the existing improved county gravel roadway and is 1.1 miles in length.

Alternative Segment 13 Wetland Impacts

Wetland impacts for the Red Road-Dead River alternative segment have been determined to be 0.02 acre.

Alternative Segment 13 Stream Impacts

There are no new stream crossings on the Red Road-Dead River alternative segment (the AAO Bridge over the Dead River was reconstructed in 2003 after the Silver Lake dam failure destroyed the bridge).

4.04.M. Alternative Segment 14. Sleepy Hollow

The Sleepy Hollow alternative segment begins with the intersection of Wolf Lake Road and Sleepy Hollow Road and ends at the intersection of Sleepy Hollow Road and Red Road (aka CR AAO). The length of the Sleepy Hollow alternative segment is 3.6 miles. The segment generally follows the existing Sleepy Hollow Road, which is an unimproved road/trail, but some realignment was considered to improve horizontal and vertical alignments and to avoid wetlands.

Alternative Segment 14 Wetland Impacts

Wetland impacts for the Sleepy Hollow alternative segment have been determined to be approximately 0.60 acres.

Alternative Segment 14 Stream Impacts

There are no stream crossings on the Sleepy Hollow alternative segment.

4.04.N. Alternative Segment 28. Clowry-Dyno Nobel

The Clowry-Dyno Nobel alternative segment starts near CR AAD on Alternative Segment 2 (the former Woodland Road route) then proceeds southwesterly past the former location of the Clowry Station on an abandoned railroad grade, then across the Middle Branch Escanaba River to CR FN through the Dyno Nobel property and across the existing railroad to US-41. The segment is 3.9 miles in length. This alternative segment was investigated to avoid crossing Second River and reduce wetland impacts.

The Clowry-Dyno Nobel segment is dependent upon the implementation of the east portion of the CR AAD (Segment 2), which would require a new crossing of Koops Creek. The Clowry segment would also require a new crossing of the Middle Branch Escanaba River. This segment is approximately 1.5 miles longer than the proposed CR 595.

Alternative Segment 28 Wetland Impacts

Approximately 4.40 acres of wetlands would be impacted by the Clowry-Dyno Nobel alternative segment.

Alternative Segment 28 Stream Impacts

There is one stream crossing in Alternative Segment 28; a crossing of the Middle Branch Escanaba River between CR FN and Clowry Station.

4.04.O. Alternative Segment 29. Grapevine Road East Bypass

The Grapevine Road East Bypass alternative segment was an alternative segment investigated for the Grapevine Road segment (Alternative Segment 30) and is 1.1 miles in length. The Grapevine Road East Bypass segment was evaluated in an effort to reduce steep grades present at other locations on the Grapevine alternative segment. The Grapevine Road East Bypass alternative segment begins near Wolf Lake Road north of Brocky Lake and goes east and south around the base of the large hills and intersects the

Grapevine Road alternative segment. While minimizing the vertical grades to some extent, the Grapevine Road East Bypass segment adds a new crossing of Connors Creek which would also impact wetlands.

Alternative Segment 29 Wetland and Stream Impacts

Due to the lack of feasibility for this alternative segment, the wetland and stream impacts were not determined.

4.04.P. Alternative Segment 30. Grapevine Road

The Grapevine Road alternative segment begins at the intersection of Wolf Lake Road and Grapevine Road north of Brocky Lake and follows Grapevine Road in a northerly and westerly direction to where Grapevine Road joins Trail 5 south of the Dead River. The Grapevine Road alternative segment is 7.0 miles in length. Grapevine Road has substantial vertical grade and horizontal alignment issues which would create problems for heavy trucks and would add about 1.6 miles to the length of the proposed road.

Alternative Segment 30 Wetland Impacts

Wetland delineation for the Grapevine Road alternative was conducted, however due to the difficulties with this segment mentioned in the preceding paragraph, an alignment was not prepared and wetland impacts were not determined.

Alternative Segment 30 Stream Impacts

The Grapevine Road alternative segment has five stream crossings; a crossing of Voelkers Creek, an unnamed creek, and three crossings of Connors Creek or its tributaries.

4.04.Q. Alternative Segment 31. West Yellow Dog River Crossing

This segment begins on Trail 5 just south of the Yellow Dog River and then proceeds north across the Yellow Dog River and associated wetlands about 400 feet upstream of the existing bridge and then north to Triple A Road. This alternative segment was evaluated as a potential segment to avoid private and State of Michigan lands on the north side of the Yellow Dog River to the east of this alternative segment.

Alternative Segment 31 Wetland Impacts

The wetland impacts of the West Yellow Dog River Crossing alternative segment were determined to be 3.50 acres, part of which is a bog. The wetland impacts on the proposed CR 595 in this segment are only 0.60 acre, which is 2.90 acres less than the Alternative Segment 31 impacts and does not impact any bogs or other peatlands.

Alternative Segment 31 Stream Impacts

This alternative segment would have one stream crossing; a new bridge would have to be constructed over the Yellow Dog River.

4.04.R. Alternative Segment 32. Yellow Dog River North

This alternative segment starts at the existing Yellow Dog River Bridge on Trail 5 and then proceeds easterly and northerly to Triple A Road, which is the north end of the proposed CR 595 project. This segment is primarily located on Trail 5 and has no wetland impacts. The crossing of the Yellow Dog River is the only stream crossing. This alternative segment is about 0.9 mile in length.

4.04.S. Alternative Segment 33. North Slope Routes

This segment begins at Mulligan Creek and then proceeds north to Trail 5 south of the Yellow Dog River and is 2.3 miles in length. Various alternatives for traversing the steep grades north of Mulligan Creek down to the Yellow Dog Plains were evaluated to determine the best horizontal and vertical alignment to avoid wetlands and provide a safe road alignment down this very steep grade.

Alternative Segment 33 Wetland Impacts

Wetland impacts for this 2.3-mile long alternative segment are approximately 3.54 acres. The efforts to avoid and minimize wetland impacts in this alternative segment resulted in over one acre of wetland impact reduction.

Alternative Segment 33 Stream Impacts

There are no stream crossings in this alternative segment but there are numerous runoff culverts proposed under the roadway to allow passage of seasonal runoff down the steep grade.

4.05 Evaluation of CR 595 Design Features Implemented to Avoid and Minimize Natural Resources Impacts

In addition to the extensive evaluation of the alternative route segments within/near the four-mile wide road study corridor presented in the preceding section, the design of the proposed CR 595 itself was carefully evaluated. The accepted design standards for a primary county road are either a 40-foot wide or 46-foot wide road section (with guardrail where appropriate and necessary) and 55 mile-per-hour (mph) design speed.

County primary road design standards are specified by American Association of State Highway and Transportation Officials (AASHTO). For example, a primary county road crown section without a guardrail as specified by AASHTO consists of two 12-foot wide paved lanes along with 8-foot wide shoulders with 3 feet paved and 5 feet gravel (40-foot total top width). Road embankment side slopes are specified as 1 on 3 grades or flatter. Crown sections with a guardrail have two 12-foot wide paved lanes along with 8-foot wide paved shoulders up to the guardrail, and 3 feet of gravel shoulder extending beyond the guardrail (46-foot total top width). Side slopes are 1 on 2 grades. These Typical AASHTO sections are provided in Appendix C. In addition, the design for a primary county road is typically performed to safely allow 55 mph speeds.

Given the need to avoid and minimize wetland impacts to the greatest extent practicable, MCRC decided that the design of CR 595 would have to be reduced to provide a 32-foot

road section (as compared to the AASHTO standards) and design speed down to 35 mph where necessary. In addition to the horizontal alignment of the proposed road, the vertical alignment was carefully scrutinized by MCRC and CEC to minimize wetland impacts by reducing the depth of fill in key areas.

One redesign feature of the proposed road that resulted in some increase in wetland impacts is the passing lanes. Passing lanes are recommended in AASHTO standards to allow for the safe flow of traffic around trucks or other slow traffic climbing steep or long grades. On new primary county roads, MCRC requires passing lanes where appropriate; therefore such passing lanes are incorporated on road sections where necessary. In areas of steep or long grades, passing lanes are proposed for safety purposes even though such lanes occasionally result in wetland impacts. MCRC determined that the proposed CR 595 should have passing lanes where appropriate to minimize traffic safety concerns.

Locations where passing lanes are appropriate are determined from MDOT Michigan Road Design Manual, Volume 3, Section 3.09.05(C). The passing lane selection criteria are:

- Long, continuous grade where the length of the passing lane is a minimum of one mile in length;
- Directional spacing of passing lanes of approximately five miles;
- Locate in areas to avoid environmental impacts to the extent feasible;
- Vertical grades are present to enhance passing opportunities between slow and fast traffic.

The net result, when taking into account each of the factors discussed in this section, is that CR 595 will have less wetland impact than a typical, AASHTO-designed, 55 mph, roadway.

4.05.A. Evaluation of Potential Alternative Alignments on the Proposed CR 595.

Safety is the number one design criteria for CR 595, as it is for all roadways. In general, the flatter and straighter a road, the safer it is. Design speed modifications have been made throughout the CR 595 roadway corridor to provide safe travel while minimizing environmental impacts. In designing CR 595, the project engineers analyzed the potential wetland impacts associated with the proposed route and exercised professional engineering judgment in specific areas which in certain instances results in slightly higher wetland impacts in order to provide for greater roadway safety. The location and design of this road has been ongoing for many years and many alternatives, large and small, have been considered. The goal of MCRC is to present a road design that offers an appropriate balance between safety and environmental protection in the CR 595 design methodology

MCRC evaluated sections of the proposed project where the proposed CR 595 deviates from an existing road in order to demonstrate that the realignment either has less wetland impact or provides for a safer road design. MCRC also considered several possible alternative routes over certain stretches of the proposed CR 595 where wetland impacts were notable and further explanation/evaluation was necessary, even though there was not necessarily an existing roadway corridor to evaluate as an alternative.

Specific Design Issues

In this narrative, some of the "micro" road alignment adjustments that were considered for the purpose of avoiding or minimizing wetland and stream impacts within the CR 595 corridor are described.

Horizontal curve radius and the associated design speed are also shown on these drawings. The vertical curves have been designed to meet the horizontal design speed. Where possible and practical, roadway elevations have been designed to minimize wetland impacts. Side slopes in wetlands have been increased in most areas to a 1 on 2 slope (standard road side slopes are 1 on 3) to reduce the roadway footprint in wetlands In accordance with MDOT and MCRC basic design standards, road side slope may not be steeper than 1 on 3 unless guardrail is provided.

Exceptions to the use of 1 on 2 side slopes are fill areas less than 5 feet in depth in wetlands less than 100 feet in length along the roadway. In areas where wetland impact is less than 100 feet along the roadway, side slopes are maintained at 1 on 3 so that short segments of guardrail can be avoided, due to safety concerns. Details of the road side slopes are provided on Sheet D in the plan and profile drawings.

In low-lying areas (typically wetlands), the height of a roadway needs to be raised substantially above existing grade in order to provide positive drainage needed to protect the structure of the roadbed from saturation. If the roadbed is not properly drained, the road will be subject to frost heaving; thereby severely compromising the road structure.

As an example, at Station 333+50 (Plan Sheet 8 – Trembath Lake Outlet, see below), a 30-inch culvert would need to be proposed for cross drainage, with approximately 3½ feet of cover to protect the culvert and to meet the vertical design speed, resulting in a 6-foot overall road height. At this specific location the existing Wolf Lake Road is 28 feet wide. The proposed CR 595 roadway would be 32 feet wide (two 12-foot wide paved lanes plus one foot paved shoulders and three-foot unpaved shoulders per the MCRC specification). This would result in a road footprint at the toe of slope of approximately 60 feet (32-foot wide roadbed plus 28 feet to accommodate the side slopes). In this stretch, wetlands run approximately 700 feet along the sides of the existing roadway. Over this length of roadway, the anticipated necessary construction would impact approximately 19,600 square feet (0.45 acres) of wetlands.

Table 4-2A. Plan Sheet 8 (Trembath Lake Outlet) - between Station 327+00 to 341+00

Road Alignment	Design Speed	Wetland Impact
CR 595	55 mph	0.7 acres
Existing Road Alignment	<30 mph design speed	0.4 acres

Constructing CR 595 along the existing Wolf Lake Road alignment in this area would impact 0.3 acres of wetland less than the proposed CR 595 alignment, but would result in three low-speed curves in a span of about 1,200 feet. One curve would be rated at 30 mph and two of them would be less than 30 mph. The northerly two curves would create an S-curve situation with a very short straight section between them. Creating sharp S-curves in which the road before and after is designed for at least 50 mph for a mile in each direction is a very unsafe condition. This alternative to the proposed CR 595 alignment was therefore not given further consideration by the applicant.

Table 4-2B. Plan Sheet 9 (North Wolf Lake Road) between Station 347+00 to 365+00

Road Alignment	Design Speed	Wetland Impact
CR 595	55 mph	0.4 acres
Existing Road Alignment	<30 mph	0.7 acres

In this stretch of roadway, the proposed CR 595 alignment impacts less wetland area than following the existing Wolf Lake Road. The proposed CR 595 road will provide a safer vertical alignment and will be widened for increased safety. The proposed CR 595 alignment impacts a relatively short distance of Wetland A58 compared to the length of the wetland crossing on the existing Wolf Lake Road. Following the existing Wolf Lake Road includes four horizontal curves, all of them having design speeds less than 30 mph in relatively close proximity to each other, which is considered an unsafe road design. If the existing Wolf Lake Road is widened and the horizontal curves realigned, much more wetland impact would result.

Table 4-2C. Plan Sheet 10 (North Wolf Lake Road) between Station 371+00 to 390+00

Road Alignment	Design Speed	Wetland Impact
CR 595	45 mph	0.4 acres
Existing Road Alignment	<30 mph	0.6 acres

The evaluation of this section of Wolf Lake Road shown on plan sheet 10 shows that the proposed CR 595 alignment impacts less wetlands than following the existing Wolf Lake Road. Constructing CR 595 following the existing Wolf Lake Road as the alignment would include six horizontal curves, all of them having design speeds of 30 mph or less and in relatively close proximity to each other. As in the Station 347 – Station 365 location described above, widening and realigning the curves on Wolf Lake Road would result in even more wetland impact.

The proposed CR 595 alignment minimizes wetland impacts, especially to Wetland A54, and creates a much safer road alignment.

Table 4-2D. Plan Sheet 22 (Voelkers Creek) between Station 1236+00 to 1265+00

Road Alignment	Design Speed	Wetland Impact
CR 595	55 mph	0.8 acres
Reroute to the West	55 mph	0.9 acres

A reroute to the west of the proposed CR 595 alignment was investigated in this area in an attempt to minimize the impact to Wetland E14 at Station 1250+00 by crossing this wetland to the west at a narrow section of the wetland. There are not any substantial topographic features that would make a reroute in this area difficult. The curves for the proposed CR 595 and a potential reroute are both rated for 55 mph. However, the proposed reroute alignment in this area would result in a slight increase in overall wetland impacts even though impacts to Wetland E14 would be reduced.

Table 4-2E. Plan Sheet 24 (Trail 5 South) between Station 1293+00 to 1323+00

Road Alignment	Design Speed	Wetland Impact
CR 595	40 mph	1.4 acres
Existing Trail 5	<30 mph	0.8 acres

A reroute following the existing Trail 5 alignment in this area was investigated. Following the Trail 5 alignment would result in a reduction 0.6 acres of wetland impact as compared to the proposed CR 595 alignment here, but would include six horizontal curves in a span of about 3,000 feet, each having a design speed of less than 35 mph. This location is adjacent to a long, steep hill. The proposed designed road grade of CR 595 at this location is already at the maximum grade of 8% to descend this hill. Having a curve rated at less than 30 mph design speed at the bottom of a hill that is over a mile long, with the last portion of it at maximum grade, is an extremely dangerous situation and was therefore not given further consideration by the applicant.

Table 4-2F. Plan Sheet 29 (Trail 5) between Station 1438+00 to 1465+00

Road Alignment	Design Speed	Wetland Impact
CR 595	55 mph	1.3 acres
Reroute to the West	<30 mph	1.0 acres

A reroute to the west of the proposed CR 595 alignment was investigated in this area. It was hoped that by bypassing Wetland B40 and Wetland BBB1 to the west, it would reduce overall wetland impacts. The potential reroute in this area would result in the reduction of the total wetland impact; however there are safety issues that would make a reroute in this area undesirable. The proposed CR 595 alignment has a horizontal curve that is rated at 55 mph, but two vertical curves in this area are rated at 50 mph, including a crest vertical curve. Moving the alignment to the west where the top of the hill is higher would result in an unsafe hill crest condition. The reroute would also add three horizontal curves; two with design speeds of 40 mph and one with a design speed of less than 30 mph, significantly decreasing the safety of this section of road. Therefore this reroute was not given further consideration by the applicant.

Table 4-2G. Plan Sheet 34 (Trail 5 North) between Station 1600+00 to 1617+00

Road Alignment	Design Speed	Wetland Impact
CR 595 (800' curve)	40 mph	0.5 acres
Reroute to the West (1200' curve)	45 mph	0.6 acres
Reroute to the West (1600' curve)	50 mph	0.7 acres

A reroute to the west of the proposed CR 595 alignment was investigated in this area. The horizontal curve as currently proposed for CR 595 is a radius of 800 feet (40 mph design speed). In evaluating reroute alternatives, the radius of this curve was increased to 1,200 feet and 1,600 feet in hopes of reducing the overall wetland impact. While wetland impact in each of the cases reduced the impact in Wetland M11, increasing the radius of this curve simultaneously increased the impacts of Wetland M9, Wetland M10, and Wetland M200; with the overall wetland impacts increased. Therefore this alternative was not given further consideration by the applicant.

4.05.B. Comparison of the Proposed CR 595 to the Previously Proposed Woodland Road

The proposed CR 595 route was evaluated with the intent of revising the road alignment and design to further reduce wetland impacts from the Woodland Road to the greatest practicable extent. Hundreds of revisions were made to the originally-proposed Woodland Road route

as a result of that evaluation. The major proposed revisions to the CR 595 route as compared to that proposed in the 2009 permit application for Woodland Road include:

- The south end of the proposed route has been relocated to stay on Wolf Lake Road to a point south of Second River in order to avoid new crossings of Second River and Koops Creek and associated wetlands. This segment provides for the replacement of the existing Second River crossing (3 culverts) with a proposed 58 foot span bridge, which will be a needed improvement.

- A new segment (i.e. the "Wasie Cutoff") is located westerly from Wolf Lake Road south of Second River, which allows the proposed road to avoid the residential area along Wolf Lake Road. This segment joins the originally-proposed Woodland Road route just north of the proposed crossing of the Middle Branch Escanaba River.

  The route around Brocky Lake was revised from the eastern (aka "Porcupine") route to a route located west of Brocky Lake. This change was made at the request of landowners in the Brocky Lake area that preferred the proposed road to be west of Brocky Lake so as to not impede recreation access, which is apparently mostly to the east of Brocky Lake.

- The north end of the proposed road between Mulligan Creek and the Yellow Dog River was redesigned to avoid and minimize wetland impacts.

- Overall design of the proposed road was changed to lower the grade of the road where possible in order to minimize the need for borrow pits as well as to minimize wetland and stream impacts.

- Other revisions to the proposed CR 595 for the purpose of avoiding and minimizing wetland impacts involved the following:

  - Lowering the grade of the road in rock cut sections, which reduced the amount of fill needed for the grade of the road in adjacent sections, but increased costs.

  - Increasing certain wetland fill slopes from 1 on 3 to 1 on 2 and proposing guardrail.

  - Designing sharper curves where possible without compromising road design safety standards; i.e. reduced road design speed.

  - Designing reroutes of the proposed road to avoid or minimize wetland impact, even if the reroute involved higher costs, e.g. rock blasting.

4.05.C. Comparison of CR 595 with Woodland Road - Design Considerations Summary

The following is a brief summary of the differences in the alignments of CR 595 and Woodland Road and the resulting wetland fill areas/amounts within the relevant corridor of each alignment. Overall, the CR 595 footprint coincides with all or a portion of the Woodland Road footprint for approximately 12.3 miles (approximately 65,000 lineal feet) and completely deviates from the Woodland Road project footprint for approximately 9.1 miles (approximately 48,000 lineal feet). Wetland impacts of approximately 27.3 acres were

proposed on Woodland Road. The current CR 595 plan would impact approximately 25.45 acres.

Both roads have been designed according to the standards of American Association of State Highway and Transportation Officials (AASHTO), the Michigan Department of Transportation (MDOT), and the Marquette County Road Commission (MCRC). According to those standards, safety is the number one design criteria, with criteria such as roadway radius, sight distance and stopping distance also being given consideration. Marquette County Road Commission desires to maintain a 55 mph design speed throughout the project; however, this is not possible in certain areas within the corridor due to steep grades, the presence of large rock formations, and bodies of water and wetlands. Where the existing topography dictates that a less than 55 mph design speed be used, it is intended that the posted speed along these portions will be also be the design speed. As a function of sound and accepted road engineering practices, long stretches of 55 mph design speeds interrupted by short lengths of a lesser design speed would create unsafe driving conditions due to frequent acceleration and deceleration situations; therefore those situations have been avoided as much as possible in the design of CR 595.

Vertical and horizontal alignment changes have been made on CR 595 (as compared to the original Woodland Road) in order to avoid/minimize wetland impacts while maintaining safe driving conditions. For example, guardrails have been added in selected wetland areas where it was feasible to allow for steeper side slopes in fill sections; these measures result in a smaller footprint and less wetland impact.

The following tables compare CR 595 wetland impacts to formerly proposed Woodland Road wetland impacts as well as provide an explanation of the design factors that were considered in each reference section:

Table 4-3A. US 41 to 4,000 feet north of Middle Branch Escanaba River (approximately 1.2 miles).

Route	*Wetland Impact	Difference
Woodland Road (Station 136+49 to 198+00)	1.3 acres	0 acres
CR 595 (Station 100+00 to 162+00)	1.3 acres	

CR 595 generally follows the same alignment as Woodland Road in this section, with one exception. CR 595 follows the alignment of CR FY near wetland R4 just north of the substation. This results in a curve slower than 55 mph, but since it is near the intersection of US-41, speeds will be slower in this area due to braking for a stop sign for southbound vehicles with northbound vehicles not quite up to full speed out of the intersection. Woodland Road alignment has a larger radius and the result of this shift in alignment for CR 595 is a savings of 0.2 acre of wetland in R4. For the crossing of Middle Branch Escanaba River, guardrails added to CR 595 allow the road to have a smaller footprint with steeper side slopes in fill areas. Overall, the wetland impacts of the proposed Woodland Road and the proposed CR 595 in this section are the same (i.e. 1.3 acres).

Table 4-3B. 4,000 feet north of Middle Branch Escanaba River to the intersection of Wolf Lake Road and CR AAD (approximately 2.3 miles).

Route	*Wetland Impact	Difference
Woodland Road (Station 198+00 to 297+70, 314+15 to 328+00)	1.2 acres	-0.1 acres
CR 595 (Station 162+00 to 283+00)	1.1 acres	

CR 595 diverges from the proposed route of Woodland Road at this southern point of this section. CR 595 veers to the east and connects with Wolf Lake Road north of the railroad grade and south of Second River. The alignment of CR 595 follows Wolf Lake Road until the intersection of CR AAD, where the alignment of Woodland Road meets up with Wolf Lake Road. The CR 595 alignment avoids a new crossing of Second River and a crossing of Koops Creek as was proposed in the Woodland Road project. The CR 595 routing allows the opportunity to improve on the poor existing conditions of the Wolf Lake Road crossing of the Second River with a new 58 foot span bridge, as compared to the existing road crossing which consists of one 66 inch diameter culvert and two 36 inch diameter culverts, all in rather poor condition. Although the alignments between CR 595 and Woodland Road and completely different in this section, due to the elimination of a new Second River crossing and complete elimination of the Koops Creek crossing and their associated floodplains/wetlands, CR 595 would result in approximately 0.1 acres less wetland impact.

Table 4-3C. Intersection of Wolf Lake Road and CR AAD to the intersection of Wolf Lake Road and Kipple Creek Trail (approximately 2.2 miles).

Route	*Wetland Impact	Difference
Woodland Road (Station 328+00 to 445+00)	3.4 acres	-0.4 acres
CR 595 (Station 283+00 to 402+12)	3.0 acres	

CR 595 generally follows the Woodland Road alignment for the most part during this stretch. There are a few areas where the CR 595 alignment has been moved to the east or west to minimize the impacts to wetlands along the route. An example of this is on the north end of wetland A61. The Woodland Road alignment increased the radius on the east side of Wolf Lake Road, resulting in 1.2 acres of wetland disturbance. CR 595's alignment was shifted slightly to the west without compromising the safety of the curves in this location. CR 595 has a wetland disturbance of 0.3 acres in this area. In addition, the shift in alignment allowed a more perpendicular crossing of Trembath Creek Outlet.

Table 4-3D. Intersection of Wolf Lake Road and Kipple Creek Trail to the intersection of Wolf Lake Road and Trail 5 (approximately 3.6 miles).

Route	*Wetland Impact	Difference
Woodland Road (Station 445+00 to 699+50)	3.8 acres	+0.3 acres
CR 595 (Station 402+12/3000+00 Station Break to 3191+57)	4.1 acres	

This section is a new alignment from both the original Woodland Road and from that shown on the August 15, 2001 Draft AA/PA. This route runs west of Brocky Lake to avoid residences, and represents a change made based on public input received by MCRC.

Table 4-3E. Intersection of Wolf Lake Road and Trail 5 to Dead River Crossing (approximately 4.3 miles).

Route	*Wetland Impact	Difference
Woodland Road (Station 699+50 to 760+60, 763+00 to 924+00)	5.5 acres	-1.1 acres
CR 595 (Station 3191+57/1090+00 Station Break to 1352+00)	4.4 acres	

The alignments for CR 595 and Woodland Road for this segment generally follow Trail 5 to avoid large wetland complexes. One location where the alignments are different is near Wetland E21. The proposed CR 595 alignment was shifted approximately 350 feet to the west of the Woodland Road alignment. This shift avoided Wetland E21 completely and reduced the overall wetland impact by 0.6 acres. One other notable CR 595 shift compared to the Woodland Road alignment was just south of the Dead River by Wetland AA8. The Woodland Road alignment has an 800 foot radius curve that impacts a sizable portion of Wetland AA8 (0.8 acres). By changing this curve to a 600-foot radius and moving the alignment to the east, Wetland AA8 was avoided.

Table 4-3F. Dead River Crossing to Mulligan Creek Crossing (approximately 4.0 miles).

Route	*Wetland Impact	Difference
Woodland Road (Station 924+00 to 1007+51, 1008+50 to 1116+47, 1119+50 to 1141+00)	5.9 acres	+1.5 acres
CR 595 (Station 1352+00 to 1563+00)	6.4 acres	

The alignments for CR 595 and Woodland Road for this segment generally follow Trail 5 to avoid large wetland complexes. Some minor deviations from the Woodland Road alignment were explored where possible. Due to the presence of rock formations, extreme grade changes, bodies of water, and wetlands; drastic changes between the proposed CR 595 alignment and the Woodland Road alignment are not feasible. It should be noted that recent reexamination of wetlands throughout this section (A13, A15, BBB1, B37B, B34A, B34B, B31A, B6, B5, and B3) either expanded or delineated new wetlands that did not exist during the time of the Woodland Road design. This resulted in a 0.2 acre increase in impact. Please note that had these newly delineated areas been included in the original Woodland Road impact quantities, the overall impacts in this section would be virtually the same.

Table 4-3G. Mulligan Creek Crossing to Triple A Road (approximately 3.8 miles).

Route	*Wetland Impact	Difference
Woodland Road (Station 1141+00 to 1335+00)	6.2 acres	-1.1 acres
CR 595 (Station 1563+00 to 1762+00)	5.1 acres	

The alignment for CR 595 generally follows the Woodland Road alignment from Mulligan Creek to the bottom of the large hill on the south side of the Yellow Dog Plains. From the bottom of this hill to the Yellow Dog River, the alignment for CR 595 is very different than Woodland Road. Numerous alignments and profile designs were attempted to reduce the wetland impact for Wetland L2 to the extent practicable.

Table 4-3H. Summary of Woodland Road/CR 595 Wetland Impacts

Route	*Wetland Impact	Difference
Woodland Road	27.3 acres	-1.8 acres
CR 595	25.5 acres	

* Rounded to the nearest 0.1 acre

4.06 Comparison of Alternative Segments Evaluated for the Proposed CR 595

The comparison of the 20 alternative segments evaluated for the proposed CR 595 project is provided in Table 4-4. The proposed CR 595 route was determined based upon the assessment of the alternative segments within the four-mile wide road study corridor, but also included the Mulligan Plains East-Red Road-Sleepy Hollow segment and the Mulligan Plains West-Red Road-Sleepy Hollow Road segment that are actually partly outside of the four-mile wide corridor.

Table 4-4. Comparison of Wetland Impacts for the Proposed CR 595 Alternative Segments (Segments selected for the CR 595 route are shaded).

Alternative Number	Alternative Name	Wetland Impacts (Acres)	Reason(s) to Select or Reject Alternative
1	CR FY	1.37	Selected as the start of the proposed CR 595 on the south due to intersection location and low wetland impact.
2	Wasie Cutoff to CR AAD	1.35	Rejected due to two new stream crossings (Second River and Koops Creek); has similar wetland impact as the Wasie Cutoff and Wolf Lake Road alternative segments.
3	Wasie Cutoff to Wolf Lake Road	0.13	Selected due to no wetland impact and no streams.
4	Wolf Lake Road South	1.55	Rejected due to the higher wetland impact than the combination of the CR FY and Wasie Cutoff segment combined (1.0 acre). Also would impact 12 residences on the existing road and would have a less-desirable intersection location on US-41.
5	Wolf Lake Road	3.90	Selected as the segment (combined with the Wasie Cutoff) with less wetland impact for this segment than Alternative 2 but no new stream crossings. The existing Second River crossing will be improved.
6	Wolf Lake Road North	6.40	Not selected as the segment from the AAD intersection with Wolf Lake Road to Sleepy Hollow Road around Brocky Lake. The Kipple Creek reroute was selected by MCRC as the preferred route alignment in this area of the project. This segment has 0.60 acres less wetland impact than the Kipple Creek segment and only one new stream crossing compared to four for the Kipple Creek segment. Landowners in the Brocky Lake area preferred the Kipple Creek route.
7	Wolf Lake Road/Trail 5	15.47*	Selected as the best segment from the north end of the Kipple Creek reroute and north to Triple A Road. Topography is the primary design location challenge in this segment combined with avoiding/minimizing wetland impacts. (This segment also includes Alternative 33 below)
9	Kipple Creek Reroute	4.58	Selected as the segment to bypass Brocky Lake to the west. Wetland impact is only 0.60 acre higher and has four new stream crossings compared to one new crossing on Segment 6 east of Brocky Lake. Overall natural resources impacts are expected to be minimized with the Kipple Creek reroute; construction of a 60-foot span bridge over the Porcupine wetland on the east route around Brocky Lake is avoided.
10	Brocky Lake East Bypass	4.30	Rejected as the segment to bypass Brocky Lake to the east due to substantial horizontal and vertical alignments of the segment, added length of road.
11	Brocky Lake Road	NA	Rejected as not available due to the road being private past the Brocky Lake camps.
12	Mulligan Plains East	25.20	Rejected due to the presence of a conservation easement on property generally west of Pinnacle Falls; the segment east (downstream) of Pinnacle Falls is a very deep gorge that is not feasible or prudent to cross with the roadway.
12A	Mulligan Plains West	NA	At the time of the filing of the application for permit to the MDEQ, Segment 12A was being evaluated. One item to be resolved is the presence of a conservation easement that would have to be revised to allow the construction of the road. The potential road location is more than two miles upstream of Pinnacle Falls where the vertical alignment for crossing of the Yellow Dog River would be feasible.
13	Red Road-Dead River	0.02	Rejected due to the lack of feasibility of the Mulligan Plains segment and the Red Road-CR 510-Triple A Road segment being not meeting the project purpose for a new primary county road.
14	Sleepy Hollow	0.60	Rejected due to the segment being part of the Red Road alternative segment to Mulligan Plains and that segment is not feasible or prudent.

Table 4-4 (continued). Comparison of Wetland Impacts for the Proposed CR 595 Alternative Segments (Segments selected for the CR 595 route are shaded).

Alternative Number	Alternative Name	Wetland Impacts (Acres)	Reason(s) to Select or Reject Alternative
28	Clowry-Dyno Nobel	4.40	Rejected due to higher wetland impacts, the need to construct a new crossing of Koops Creek to implement this segment, and the additional length of road as compared to the selected segment of the CR FY, Wasie Cutoff and Wolf Lake Road alternative segments.
29	Grapevine Road East Bypass	NA	Rejected due to new crossings of Connors Creek and significant horizontal and vertical grade issues with the Grapevine Road alternative, of which this alternative segment would be a part.
30	Grapevine Road	NA	Rejected due to significant horizontal and vertical grade issues and the fact that this segment would add 1.6 miles to the road segment.
31	West Yellow Dog River Crossing	3.50	Rejected due to the increase in wetland impacts compared to the proposed segment (which only has a wetland impact of 0.6 acre to cross the Yellow Dog River and associated wetlands combined with Alternative 32 below) and this alternative crosses the Yellow Dog River in a new location 400 feet upstream of the existing bridge.
32	Existing Yellow Dog River Crossing-West/North Segment.	0	Selected as the segment from the Yellow Dog River to Triple A Road due to no wetland impact or stream crossings.
33	North Slope Segments	3.54*	Selected as a part of the Alternative 7 segment; wetland impacts were avoided and minimized by selecting the alternative segments down the steep slopes from the Mulligan Creek to the base of the hill south of the Yellow Dog Plains. Note that these wetland impacts are included in the 15.59 acres of wetland impacts listed for Alternative 7.
Total Wetland Impacts for CR 595 Segments		25.45	This wetland impact total does not include the Trail 5 relocation impacts or the East Branch Salmon Trout River stream mitigation project wetland impacts. The total wetland impact with these impacts included is 25.81 acres.

*Segment 33 impacts are included in Segment 7 impacts.

4.07 Summary of Routes Evaluated

In addition to the 20 alternative segments evaluated or considered for the proposed CR 595 route, the CR 550, CR 510, CR 510-Red Road-Sleepy Hollow, and Dishno routes were evaluated, even though the first three routes are considered by MCRC as "no-build" routes (Table 4-5). Although the Dishno route is not considered a "no-build" route, the natural resources impacts make this route undesirable compared to CR 595.

Table 4-5. Routes Evaluated or Considered for the Proposed CR 595 Project.

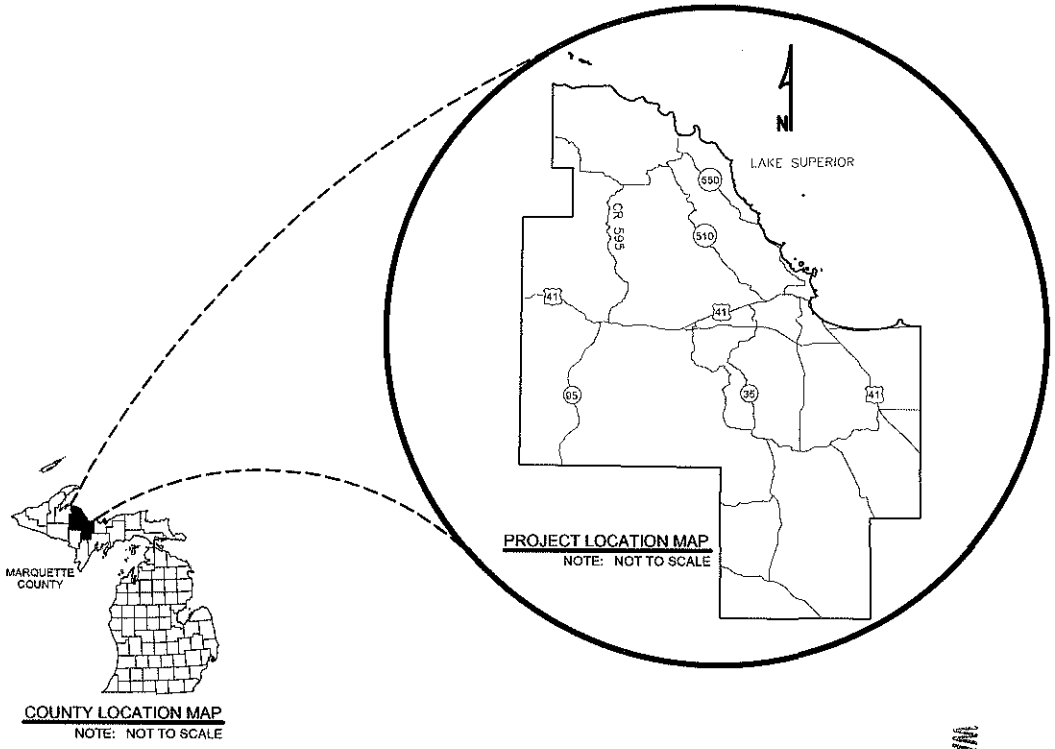
Route Name	Approximate Length of the Route (miles)	Wetland Impacts (acres)	Stream Crossings	Does the Route Meet the Project Purpose?	Primary Reasons the Route Was/Was Not Selected
Proposed CR 595	21.4	25.81	22	Yes	Proposed in 2011 Application for Permit including the Trail 5 relocation impacts and the East Branch Salmon Trout River stream mitigation
CR 550	60	1	4[1]	No	Longest route; does not meet the purpose and need for the proposed CR 595; therefore is a "no-build" alternative.
CR 510	51	29[2]	56	No	Highest level of emissions; wetland and stream impacts are high. Length of route is not prudent; does not meet the purpose and need for the proposed CR 595.
Dishno	28	47	29	Yes	High wetland impacts; estimates of wetland impacts are using NWI and about 10 acres of additional wetland impacts are expected if delineation is done. Lineal feet of stream relocation and other stream impacts are high. DEQ and EPA agreed this alternative should not be further evaluated.
Mulligan Plains East-Red Road-Sleepy Hollow	26.4	25	12	Yes	Environmental sensitivity and very high construction costs for crossing the Yellow Dog River valley downstream of Pinnacle Falls.
Mulligan Plains West-Red Road-Sleepy Hollow	NA	NA	NA	Yes	The Mulligan Plains West route has been determined to be feasible but is not prudent, as explained in section 4.04.K.
CR 510-Red Road-Callahan Road-US-41	44	Not determined.	Not determined.	No	Would directly or indirectly impact many private properties, is likely to have more wetland impact than the proposed alternative based on the wetlands in the corridor evaluated with GIS, and is therefore not feasible or prudent. DEQ and EPA agreed this alternative should not be further evaluated (verified by letter dated 11/18/10).
CR 510-Red Road-Gold Mine Lake Road-US-41	42.5	Not determined.	Not determined.	No	Would directly or indirectly impact many private properties, is likely to have more wetland impact than the proposed alternative based on the wetlands in the corridor evaluated with GIS, and is therefore not feasible or prudent. DEQ and EPA agreed this alternative should not be further evaluated (verified by letter dated 11/18/10).
CR 510-Red Road-Sleepy Hollow-Wolf Lake Road-US-41	41.3	13.04	35	No	Wetland delineation and preliminary design plans were prepared to accurately compare this alternative to the proposed CR 595. The 19.9 miles of additional length make this alternative not feasible or prudent due to excessive capital and maintenance costs.

[1] Denotes the number of existing stream crossings that must be replaced if the CR 550 route is implemented, not including the three East Branch Salmon Trout River crossings on Triple A Road.

[2] Wetland impacts were estimated in the 2009 application for the CR 510 alternative using NWI data.

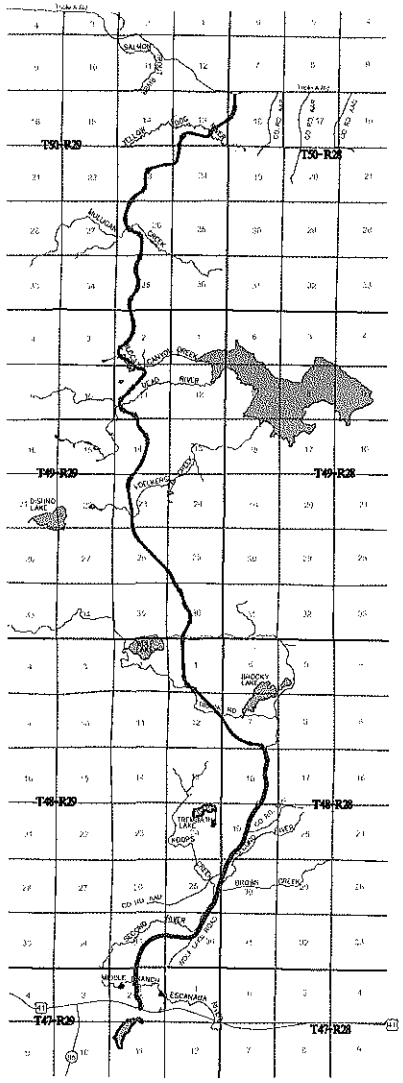
COUNTY ROAD 595
STREAM CROSSINGS

MARQUETTE COUNTY, MICHIGAN



PROJECT LOCATION MAP
NOTE: NOT TO SCALE

COUNTY LOCATION MAP
NOTE: NOT TO SCALE



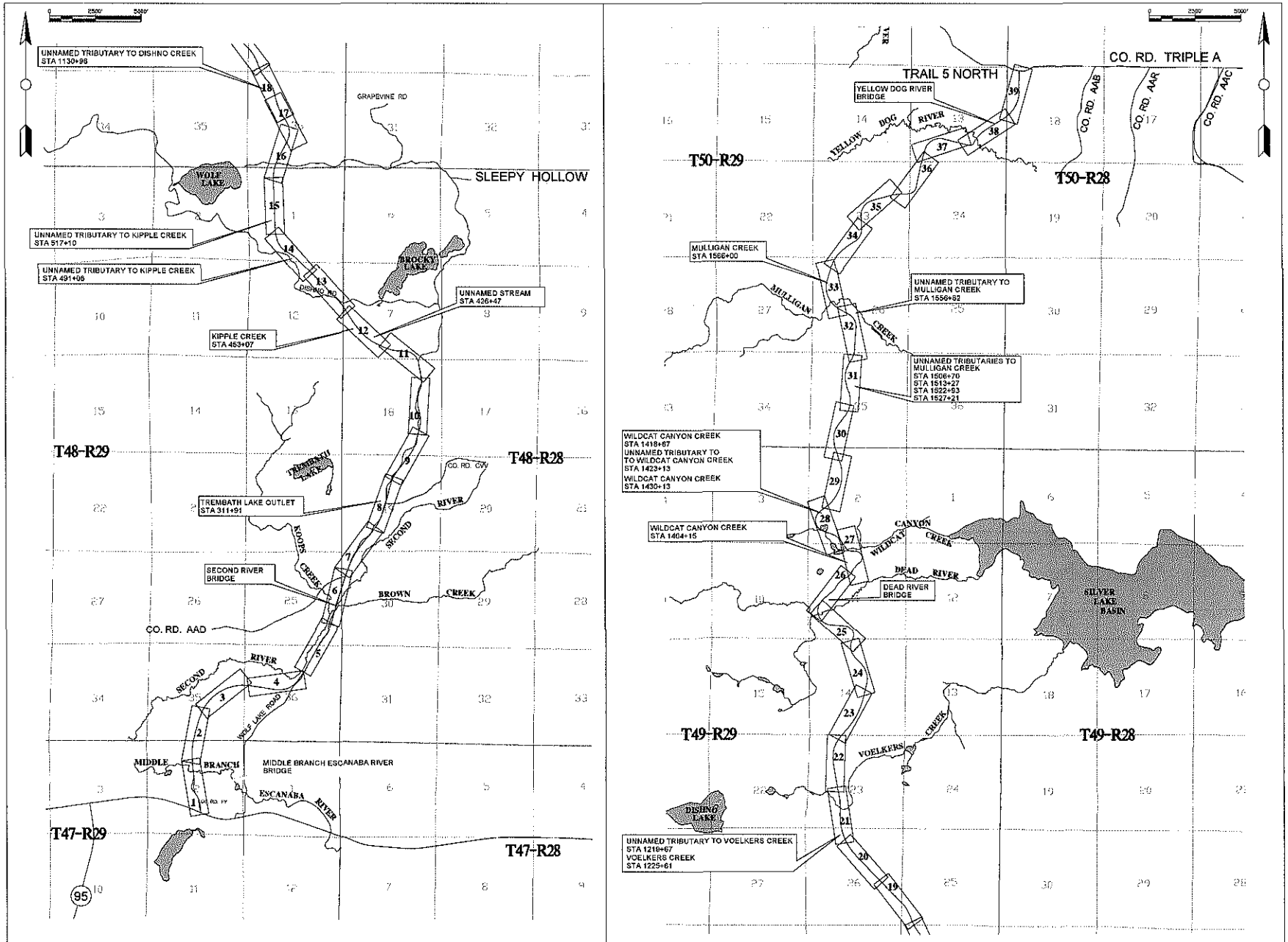
COLEMAN ENGINEERING COMPANY
635 CIRCLE DRIVE – IRON MOUNTAIN, MICHIGAN 49801 (906) 774-3440
200 EAST AYER STREET – IRONWOOD, MICHIGAN 49938 (906) 932-5048

STREAM CROSSINGS
COUNTY ROAD 595 MARQUETTE COUNTY, MICHIGAN

CADD DRAWING
595 FIGURE COVERS
KIPPLE

DATE:
1/06/12

A



COLEMAN ENGINEERING COMPANY
635 CIRCLE DRIVE – IRON MOUNTAIN, MICHIGAN 49801 (906) 774-3440
200 EAST AYER STREET – IRONWOOD, MICHIGAN 49938 (906) 932-5048

STREAM CROSSING INDEX
COUNTY ROAD 595 MARQUETTE COUNTY, MICHIGAN

CADD DRAWING
595-STREAM
CROSSING INDEX

DATE:
11/23/11

A1

STREAM CROSSING SCHEDULE

6-Jan-2012

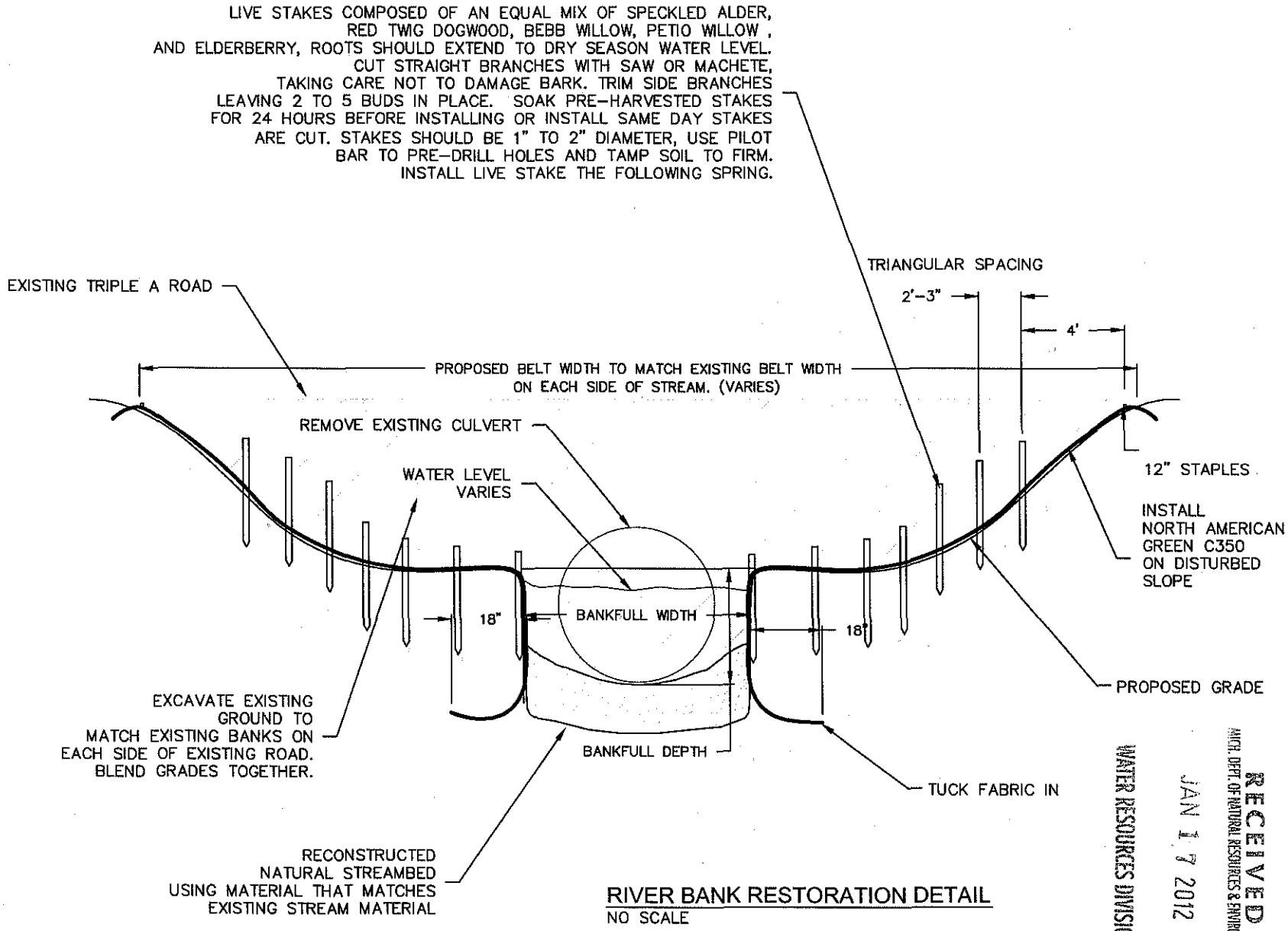
All box culverts and Conspans use wing walls as entrance treatment.

Culvert #	Regulated Stream	Station	Page #	Proposed Structure AFP Plans	Centerline Road Elevation	Centerline Drainage Structure Beam/Crown Elevation	Centerline Stream Elevation	Left Culvert Invert Elevation	Right Culvert Invert Elevation	Culvert Bury Depth	Bankfull Width	Upstream Riffle Elev.	Downstream Riffle Elev.	SSM Slope %	Plain Rip Rap Fill (CYD)	Heavy Rip Rap Fill (CYD)	Length of Streambed Reconstruction (Feet)	Natural Streambed Material Fill (CYD)	Existing Structure To Be Removed
	Middle Branch Escanaba	122+75	1	60' Span Bridge	1533.81	1530.89	1526.04	---	---	---	32.2'	---	---	---	---	112.0	---	---	None
	Second River	261+00	6	58' Span Bridge	1563.22	1560.30	1554.03	---	---	---	14.5'	---	---	---	---	152.0	40	53.7	2 - 36", 42"x66" Arch
E6	Trembath Lake Outlet	311+91	8	12' Span x 5' Rise x 73' Length Box	1576.31	1571.26	1567.86	1566.44	1566.08	1.6'	9.4'	1568.13	1567.55	0.50	22.7	---	80	18.1	2 - 24"
E99	Unnamed Stream	426+47	12	6' Span x 4' Rise x 103' Length Box	1740.67	1725.81	1722.51	1725.39	1716.40	0.7'	4.7'	1729.26	1714.58	8.80	7.3	---	20	8.6	None
E102	Kipple Creek	453+07	12	12' Span x 6' Rise x 66' Length Box	1675.91	1669.36	1665.06	1663.15	1663.57	1.7	10.2'	1665.23	1664.22	0.73	7.3	---	30	17.3	None
E105	Unnamed Tributary to Kipple Creek	491+08	14	6' Span x 4' Rise x 112' Length Box	1690.45	1676.95	1673.65	1672.42	1673.46	0.7'	3.9'	1674.79	1672.86	0.93	19.3	---	25	20.4	None
E109	Unnamed Tributary to Kipple Creek	517+10	15	6' Span x 4' Rise x 101' Length Box	1717.94	1712.61	1709.31	1709.29	1707.89	0.7'	3.6'	1710.12	1708.56	1.41	19.3	---	30	20.1	None
M1	Unnamed Tributary to Dishno Creek	1130+96	18	6' Span x 4' Rise x 47' Length Box	1739.59	1735.80	1732.60	1731.21	1732.38	0.8'	4.3'	1733.56	1731.57	2.51	33.0	---	50	30.4	8"
D28	Unnamed Tributary to Voelkers Creek	1219+67	21	6' Span x 4' Rise x 97' Length Box	1755.09	1746.61	1743.31	1743.80	1741.47	0.7'	3.9'	1742.85	1740.00	2.42	12.6	---	20	11.0	None
D29	Voelkers Creek	1225+61	21	10' Span x 5' Rise x 61' Length Box	1744.79	1740.28	1736.68	1735.52	1735.08	1.4'	8.1'	1736.83	1735.86	0.81	64.2	---	40	35.3	48"
	Dead River	1352+75	26	24' Span x 10' Rise Conspan x 68' Length	1562.01	1556.33	1548.00	---	---	---	28.1'	---	---	---	---	66.0	---	---	Timber Bridge
D44	Wildcat Canyon Creek	1404+15	27	7' Span x 5' Rise x 67' Length Box	1679.67	1673.41	1669.31	1668.57	1668.21	0.9'	5.0'	1669.67	1669.14	0.53	37.1	---	30	14.7	2 - 36"
D46	Wildcat Canyon Creek	1418+67	28	6' Span x 6' Rise x 87' Length Box	1693.06	1681.90	1676.60	1675.88	1675.93	0.7'	3.9'	1676.59	1676.50	0.06	17.0	---	20	15.3	30"
D47	Unnamed Trib. to Wildcat Canyon Creek	1423+13	28	6' Span x 4' Rise x 79' Length Box	1690.04	1683.92	1680.42	1680.11	1679.67	0.5'	2.6'	1680.11	1679.34	0.56	14.1	---	20	18.0	24"
D48	Wildcat Canyon Creek	1430+13	28	8' Span x 6' Rise x 107' Length Box	1721.32	1716.32	1711.32	1705.09	1703.06	1.0'	6.0'	1706.24	1704.05	1.90	47.5	---	25	17.3	24"
D57	Unnamed Tributary to Mulligan Creek	1506+70	31	10' Span x 6' Rise x 77' Length Box	1725.69	1716.67	1712.06	1713.01	1707.78	1.4'	8.3'	1716.98	1707.81	6.79	62.9	---	20	14.0	24" & 36"
D59	Unnamed Tributary to Mulligan Creek	1513+27	31	6' Span x 4' Rise x 70' Length Box	1716.64	1709.89	1706.49	1706.42	1705.32	0.6'	3.1'	1707.28	1705.74	1.51	34.1	---	20	6.7	36"
D60	Unnamed Tributary to Mulligan Creek	1522+93	31	5' Span x 3' Rise x 113' Length Box	1727.13	1716.80	1714.30	1718.44	1703.83	0.5'	2.5'	1721.44	1701.67	13.40	9.6	---	25	18.8	6"
D61	Unnamed Tributary to Mulligan Creek	1527+21	31	4' Span x 3' Rise x 98' Length Box	1719.15	1710.82	1708.12	1711.23	1699.69	0.3'	1.6'	1716.84	1700.37	12.10	8.1	---	35	31.3	Size Unknown, Buried
D64	Unnamed Tributary to Mulligan Creek	1556+82	32	4' Span x 3' Rise x 77' Length Box	1707.37	1702.36	1699.76	1700.79	1697.69	0.4'	2.0'	1701.38	1696.93	4.05	8.1	---	20	16.4	None
	Mulligan Creek	1565+25	33	36' Span x 11' Rise Conspan x 54' Length	1694.80	1688.13	1679.38	---	---	---	14.4'	---	---	---	---	92.0	---	---	Timber Bridge
	Yellow Dog River	1715+00	38	55' Span Bridge	1422.73	1419.70	1412.87	---	---	---	21.5'	---	---	---	---	97.0	---	---	Steel Beam Bridge
	East Branch Salmon Trout River	29+74	SM6	65' Span Bridge	1192.92	1190.00	1178.00	---	---	---	12.0	---	---	---	---	125.0	90	53.3	3 - 36-48" Culverts
														TOTAL =	**424.2**	**644.0**	**640**	**420.7**	

COUNTY ROAD 595 - FLOODPLAIN ACTIVITIES

16-Dec-2011

Floodplain Activity	Station	Description	100-Year Floodplain Elevation	Fill Below the 100-Year Floodplain Elevation	Comp. Cut Below the 100-Year Floodplain Elevation	Remarks	Corr. Plan and Profile Sheet #	Detail Sheet #
Fill	122+75	Middle Branch Escanaba River Crossing	1530.39	3,746	7,764	Compensatory Cut proposed 300' left of Station 119+00 upstream of the MB Escanaba River Bridge Crossing.	1	CC-1 CC-2
Fill	261+00	Second River Crossing	1557.21	2,084		Compensatory Cut proposed 300' left of Station 119+00 upstream of the MB Escanaba River Bridge Crossing. No Compensatory Cut at this location due to lack of at-risk infrastructure in between the Second River and the MB Escanaba River.	6	CC-3
Fill	1352+75	Dead River Crossing	1551.17	457	2,357	Compensatory Cut proposed 100' left of Station 1351+00 upstream of the Dead River Bridge Crossing.	26	CC-4
Fill	1565+25	Mulligan Creek River Crossing	1683.81	1,667		Compensatory Cut proposed 100' left of Station 1351+00 upstream of the Dead River Bridge Crossing. No Compensatory Cut at this location due to bedrock at grade.	33	CC-5
Fill	1715+00	Yellow Dog River Crossing	1415.80	1,346	1,462	Compensatory Cut proposed 400' right of Station 1714+00 downstream of the Yellow Dog River Bridge Crossing.	38	CC-6
CR 595 TOTAL =				**9,300**	**11,583**			



RIVER BANK RESTORATION DETAIL

NO SCALE

COLEMAN ENGINEERING COMPANY
635 CIRCLE DRIVE – IRON MOUNTAIN, MICHIGAN 49801 (906) 774-3440
200 EAST AYER STREET – IRONWOOD, MICHIGAN 49938 (906) 932-5048

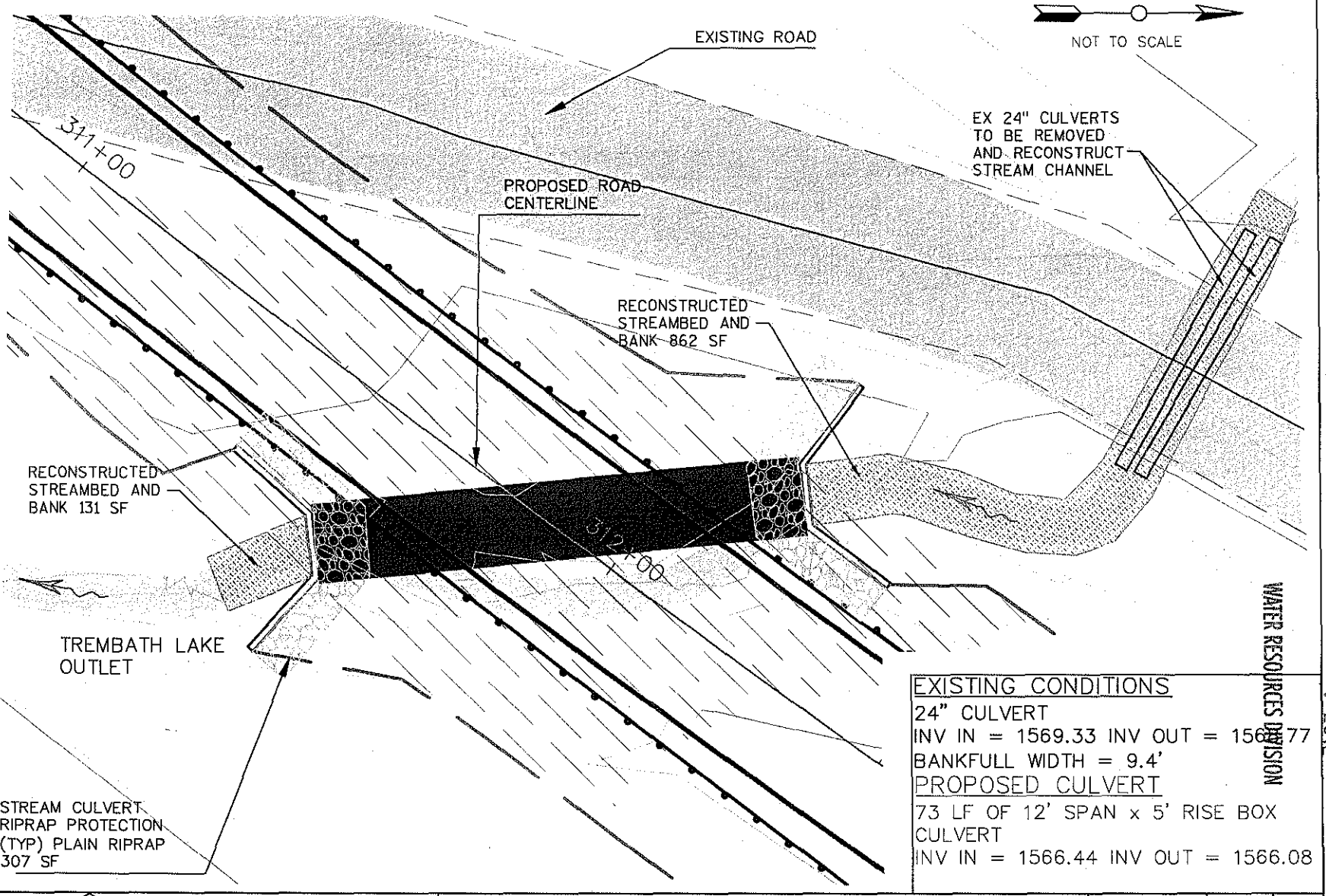
DETAIL - STREAM CROSSINGS
COUNTY ROAD 595 MARQUETTE COUNTY, MICHIGAN

CADD DRAWING: 595-STREAM-SHEET C

DATE: 12/15/11

C

STREAM BOX CULVERT E6
TREMBATH LAKE OUTLET
STA 311+91



EXISTING CONDITIONS

24" CULVERT

INV IN = 1569.33 INV OUT = 1568.77

BANKFULL WIDTH = 9.4'

PROPOSED CULVERT

73 LF OF 12' SPAN x 5' RISE BOX CULVERT

INV IN = 1566.44 INV OUT = 1566.08

COLEMAN ENGINEERING COMPANY
635 CIRCLE DRIVE – IRON MOUNTAIN, MICHIGAN 49801 (906) 774-3440
200 EAST AYER STREET – IRONWOOD, MICHIGAN 49938 (906) 932-5048

STA 311+91 TREMBATH LAKE OUTLET - STREAM CROSSINGS
COUNTY ROAD 595 MARQUETTE COUNTY, MICHIGAN

CADD DRAWING: 595 STREAM SECTIONS

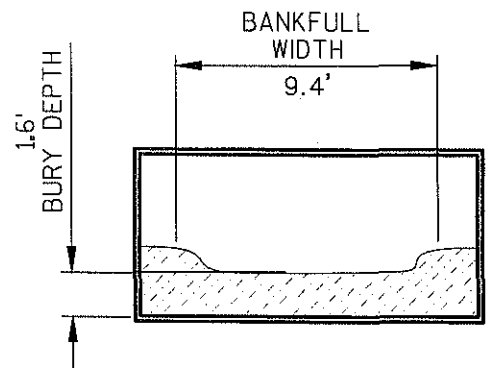
DATE: 12/15/11

1P

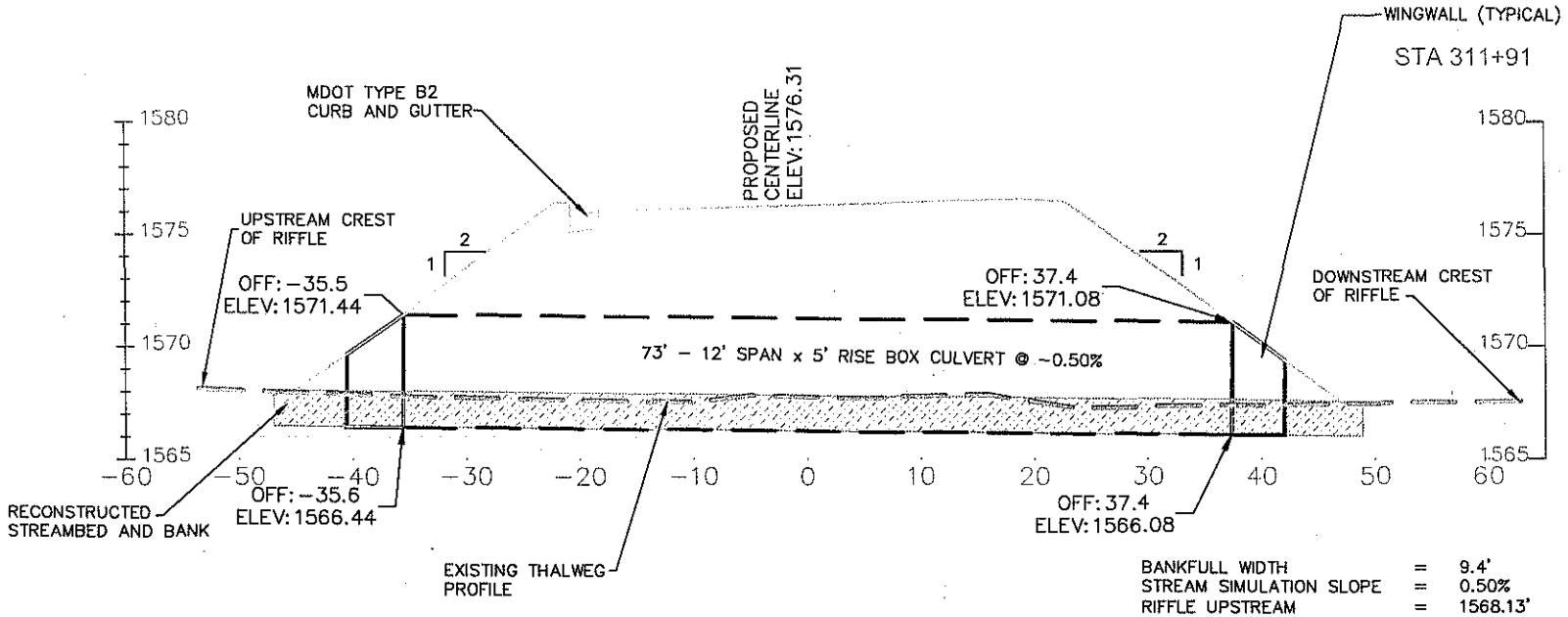
STREAM BOX CULVERT E6
TREMBATH LAKE OUTLET
STA 311+91

NOTES:
- STREAM CHANNEL AND BANKS MUST BE EXCAVATED FOR INSTALLATION.
- BURY BOTTOM MIN. ⅛ BANKFULL WIDTH UP TO 2' MAX.

NOTE: MATERIAL FOR THE RECONSTRUCTION OF THE STREAMBED AND BANK WITHIN THE CULVERT WILL BE PLACED AS THE SECTIONS OF THE CULVERT ARE INSTALLED. THE APPROPRIATE SIZE AND COMPOSITION OF THE MATERIAL TO RECONSTRUCT THE STREAMBED AND BANK WILL BE DETERMINED DURING THE PREPARATION OF THE FINAL CONSTRUCTION PLANS ACCORDING TO PEBBLE COUNTS TO BE TAKEN FOR EACH STREAM.



TYPICAL SECTION
12' SPAN x 5' RISE BOX



BANKFULL WIDTH	=	9.4'
STREAM SIMULATION SLOPE	=	0.50%
RIFFLE UPSTREAM	=	1568.13'
RIFFLE DOWNSTREAM	=	1567.55'

COLEMAN ENGINEERING COMPANY
635 CIRCLE DRIVE - IRON MOUNTAIN, MICHIGAN 49801 (906) 774-3440
200 EAST AYER STREET - IRONWOOD, MICHIGAN 49938 (906) 932-5048

STA 311+91 TREMBATH LAKE OUTLET - STREAM CROSSINGS
COUNTY ROAD 595 MARQUETTE COUNTY, MICHIGAN

CADD DRAWING: 595 STREAM SECTIONS

DATE: 12/15/11

1S

9.0 STREAM MITIGATION

Stream mitigation for the proposed CR 595 project is multi-faceted and entails studies conducted during the design phase of the project, implementation of special design criteria, and stream mitigation projects that will be implemented during construction. The stream mitigation plan includes the following four components:

- The implementation of aspects of Stream Simulation Methodology for stream crossing design;
- The proper replacement of inadequately sized existing culverts or bridges;
- The design of the proposed road to direct runoff to uplands and wetlands and not directly into streams; and,
- A significant stream restoration project where the East Branch Salmon Trout River crosses Triple A Road that is proposed as mitigation for unavoidable stream impacts on the proposed CR 595.

The combination of the four components of stream mitigation will result in a significant improvement to the stream environments in the study area.

The CR 595 project has 22 stream crossings regulated by Part 301; 6 clear-span bridges and 16 concrete box culverts. The list of 6 clear-span bridges includes the 2 Conspan® bridges that span the streams. In addition, the East Branch Salmon Trout River stream mitigation project on Triple A Road will be a clear-span bridge and is included on the list of stream crossings for this project. Table 9-1 lists the stream crossing structures in the proposed CR 595 project.

Table 9-1. Stream Crossings on the CR 595 Project.

Crossing Number	Stream (culvert identification)	Station	Plan Page #	Proposed Structure	New (N) or Replacement (R) Structure
1	Middle Branch Escanaba River	122+75	1	60' Span Bridge	N
2	Second River	261+00	6	58' Span Bridge	R
3	Trembath Lake Outlet (E6)	311+91	8	12' Span x 5' Rise Box Culvert	R
4	Unnamed (E99)	426+47	12	6' Span x 4' Rise Box Culvert	N
5	Kipple Creek (E102)	453+07	12	12' Span x 6' Rise Box Culvert	N
6	Unnamed Tributary to Kipple Creek (E105)	491+08	14	6' Span x 4' Rise Box Culvert	N
7	Unnamed Tributary to Kipple Creek (E109)	517+10	15	6' Span x 4' Rise Box Culvert	N
8	Unnamed Tributary to Dishno Creek (M1)	1130+96	18	6' Span x 4' Rise Box Culvert	R
9	Unnamed Tributary to Voelkers Creek (D28)	1219+67	21	6' Span x 4' Rise Box Culvert	N
10	Voelkers Creek (D29)	1225+61	21	10' Span x 5' Rise Box Culvert	R
11	Dead River	1352+75	25	24' Span x 10' Rise Conspan® Bridge	R
12	Wildcat Canyon Creek (D44)	1404+15	27	7' Span x 5' Rise Box Culvert	R
13	Wildcat Canyon Creek (D46)	1418+55	28	6' Span x 6' Rise Box Culvert	R
14	Tributary to Wildcat Canyon Creek (D47)	1423+19	28	6' Span x 4' Rise Box Culvert	R
15	Wildcat Canyon Creek (D48)	1430+13	28	8' Span x 6' Rise Box Culvert	R
16	Unnamed Tributary to Mulligan Creek (D57)	1506+70	31	10' Span x 6' Rise Box Culvert	R
17	Unnamed Tributary to Mulligan Creek (D59)	1513+27	31	6' Span x 4' Rise Box Culvert	R
18	Unnamed Tributary to Mulligan Creek (D60)	1522+93	31	5' Span x 3' Rise Box Culvert	R
19	Unnamed Tributary to Mulligan Creek (D61)	1527+21	31	4' Span x 3' Rise Box Culvert	R
20	Unnamed Tributary to Mulligan Creek (D64)	1557+00	32	4' Span x 3' Rise Box Culvert	N
21	Mulligan Creek	1565+25	33	36' Span x 11' Rise Conspan® Bridge	N
22	Yellow Dog River	1712+00	38	55' Span Bridge	R
23	East Branch Salmon Trout River	30+00	SM6	65' Span Bridge	R

As recommended by MDNR fisheries biologists in comments submitted on January 19, 2010 for the Woodland Road project, the project design team has implemented the following BMPs from the U.S. Department of Agriculture 2008 Stream Simulation Working Group for the CR 595 project:

- Roadside ditches will not discharge directly to streams. Stormwater runoff will be directed to a vegetated buffer area or other discharge location, both during and after construction.

- All disturbed slopes will be stabilized to minimize sediment production and silt fence will be installed to contain any soil erosion until maintenance can be performed.

- Chronic disturbance of road fill will be avoided during road maintenance to maintain stable road embankments and ditches.

- Road maintenance will include re-vegetating or replacement of rip rap as needed to maintain stable slopes and ditches.

- Road drainage is directed away from the road slope whenever possible and cross-road drainage culverts are proposed to maintain existing stormwater runoff patterns to the extent possible.

- The entire proposed road will be paved, which will substantially minimize erosion and sediment transport into streams. Other measures such as diversion channels, downspouts, outfalls, curbing, and vertical road alignments to avoid low points and subsequent discharge being at stream crossings are also proposed to keep road runoff from directly entering streams.

9.01 Stream Simulation Methodology

The first component of stream mitigation for the proposed CR 595 is the assessment of each regulated crossing using aspects of Stream Simulation Methodology that is being adopted by MDEQ and MDNR in the permitting process. The Stream Simulation Methodology seeks to maintain ecosystem processes at stream crossings by maintaining or creating an unfragmented stream bottom and bank edge habitat through the stream crossing bridge or culvert. This methodology has not been widely implemented in Michigan, especially for transportation projects, and the application of the methodology on the CR 595 project will be valuable experience for MDEQ, MDNR, and the MCRC and their consultants.

Two KME personnel that have training in natural stream channel design conducted field surveys for each of the stream crossings on the proposed CR 595. CEC surveyors worked with KME in the field to conduct the surveys to gather the specific elevations and other survey data needed for the Stream Simulation process. Once field data were gathered, KME worked closely with CEC engineers to design each stream crossing to ensure compliance with the Stream Simulation Methodology. The report summarizing the data gathered for the CR 595 stream crossings using aspects of Stream Simulation Methodology is provided in Appendix L. Data such as bankfull width of the streams at proposed crossings, streambed slope, and location of riffles are provided on the stream crossing detail drawings in this application for permit.

The implementation of aspects of Stream Simulation Methodology will ensure that each of the 22 stream crossings and the East Branch Salmon Trout River stream restoration project proposed will have minimal long-term impact on the stream and near-stream habitat and, as such, is stream mitigation that is implemented in the design and construction phases of the project.

9.02 Replacement of Improperly Sized or Installed Stream Crossing Structures

The second step in the stream mitigation plan is the proper replacement of inadequately sized existing culverts or bridges. Of the 22 regulated stream crossings in the CR 595 project, 15 are existing stream crossings and seven will be new crossing locations. Of those 15 existing crossings, all of them are considered to be inadequately sized or are having degrading effects on the stream habitat. Table 9-1 above shows the stream crossing structures that will be replaced as part of the CR 595 project. In addition, as explained in section 9.4, the East Branch Salmon Trout River stream mitigation project will result in the replacement of three existing culverts with a new clear-span bridge and the restoration of the stream where the three existing culverts are to be removed.

The removal of the 15 existing stream crossing structures and replacing them with bridges or box culverts that have been properly designed using aspects of Stream Simulation Methodology will substantially improve the stream habitat and wildlife movement along the stream corridors. A concerted effort was made during the planning and design of the proposed CR 595 to locate the proposed road to cross streams at existing locations in order to 1) minimize the disruption to stream/wetland corridors and, 2) to remove existing inadequately sized or improperly installed bridges and culverts as an important component of stream mitigation.

9.03 Direct Road Runoff Away From Streams

A prime design requirement that is a form of stream mitigation is to direct stormwater runoff from the proposed CR 595 into uplands, or in some cases wetlands, to avoid runoff outlets directly into streams. Bridges do not have downspouts from the deck into streams and the bridge elevations direct water away from the stream. Curbs are proposed on bridges and culverts where necessary to direct runoff away from the stream to appropriate discharge locations.

A related practice to protect streams will be to implement every reasonable measure during construction to avoid introduction of sediment into streams. This will be accomplished with the deployment of Best Management Practices for soil erosion control and proper maintenance of those practices until each site is permanently stabilized.

9.04 Stream Mitigation Project

The fourth component of the stream mitigation plan is the relocation of a portion of Triple A Road and the removal and restoration of three existing culvert crossings on the East Branch Salmon Trout River. The road relocation will reduce the number of stream crossings over the East Branch Salmon Trout River on Triple A Road from three to one. The proposed new stream crossing is a 65-foot span box beam bridge that will span the bankfull width of the East Branch Salmon Trout River and will not disturb the natural stream bottom or banks. The plans for the stream restoration project are included in the plan and profile drawings.

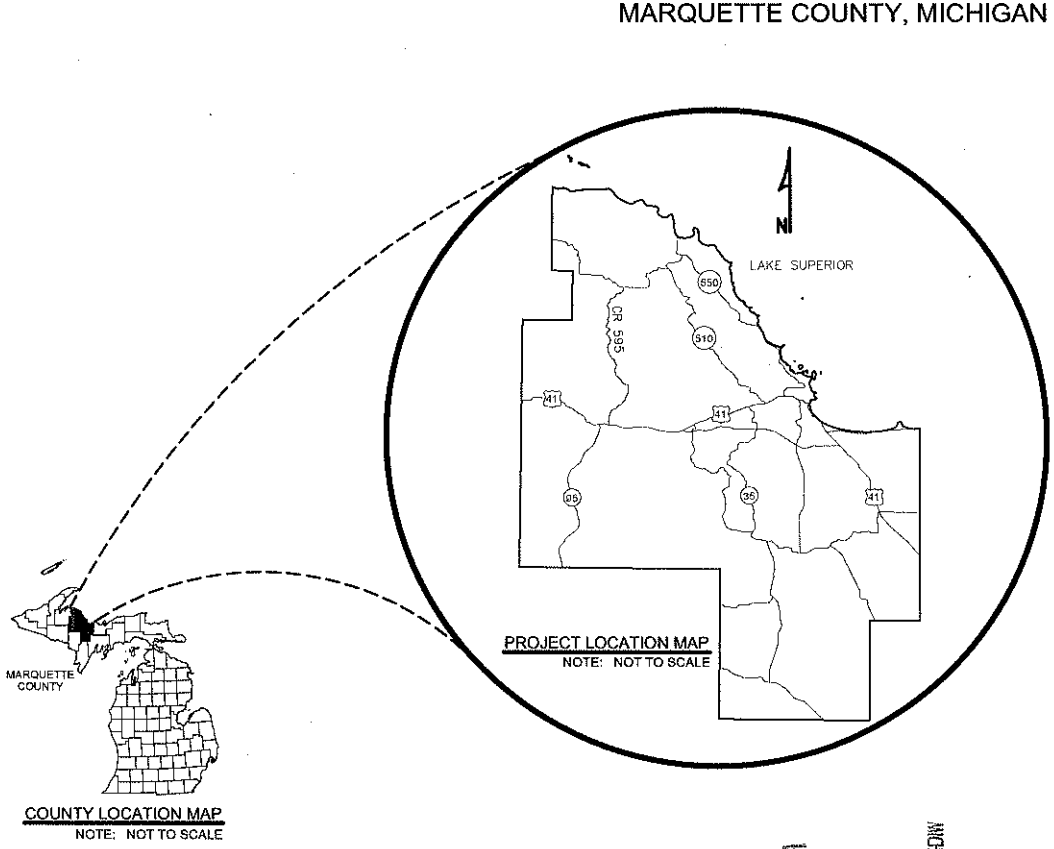
The three existing 36-inch diameter culverts that pass the East Branch Salmon Trout River under Triple A Road will be removed upon completion of the road relocation and the portion of the existing road embankment that may contribute to the degradation of the stream will be removed. The streambed will be restored using natural stream channel design to ensure the long-term stability of the stream in the restored sections. The overbank areas adjacent to the stream will also be graded to naturalize the stream corridor and restore a proper floodplain adjacent to the stream. Portions of the existing Triple A Road right-of-way that are not necessary for landowner access will be abandoned and reverted to the appropriate landowners.

This stream restoration project is a significant undertaking. The project will rectify a situation that has had negative impacts on the East Branch Salmon Trout River for many years and will create a more reliable secondary road access to the Yellow Dog Plains.

The East Branch Salmon Trout River stream mitigation plans are provided in Appendix H.

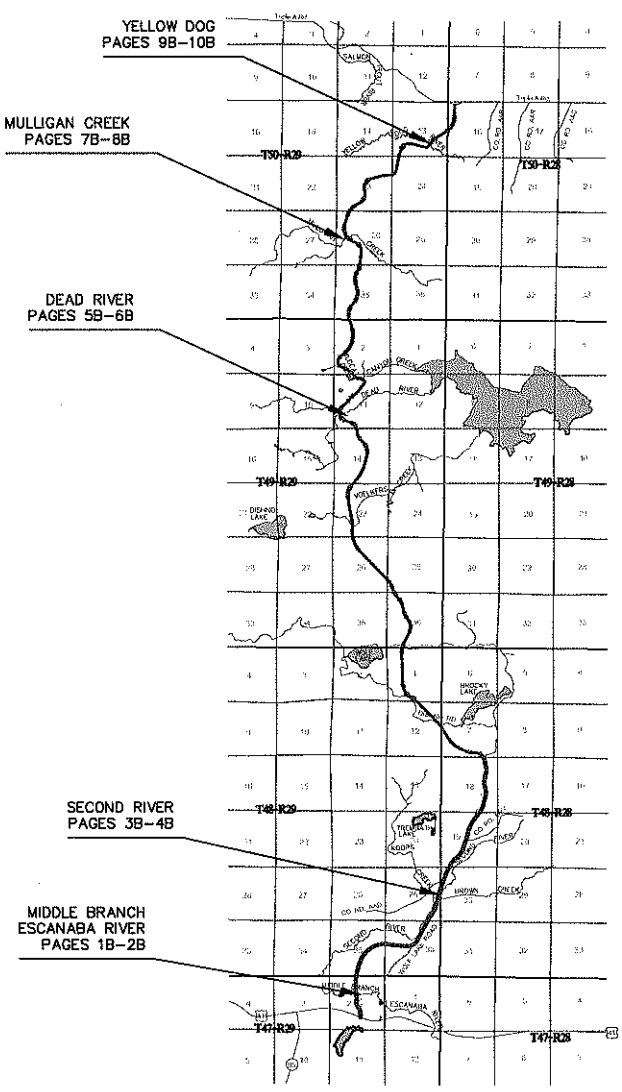
COUNTY ROAD 595
PROPOSED BRIDGE PLANS

MARQUETTE COUNTY, MICHIGAN



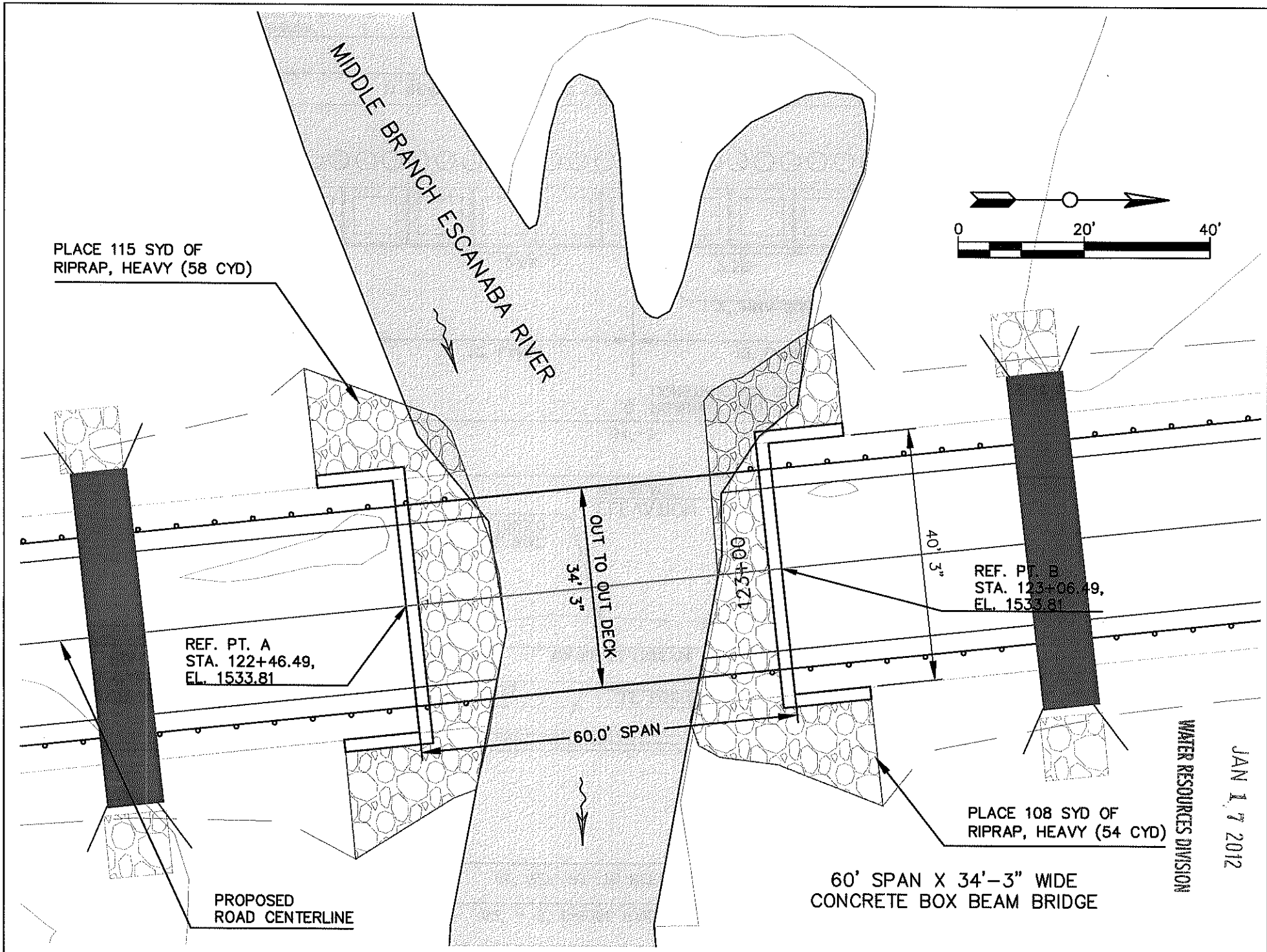
PROJECT LOCATION MAP
NOTE: NOT TO SCALE

COUNTY LOCATION MAP
NOTE: NOT TO SCALE



RECEIVED
MICH. DEPT. OF NATURAL RESOURCES & ENVIRONMENT
JAN 17 2012
WATER RESOURCES DIVISION

COLEMAN ENGINEERING COMPANY 635 CIRCLE DRIVE – IRON MOUNTAIN, MICHIGAN 49801 (906) 774-3440 200 EAST AYER STREET – IRONWOOD, MICHIGAN 49938 (906) 932-5048	PROPOSED BRIDGE PLANS COUNTY ROAD 595 MARQUETTE COUNTY, MICHIGAN	CADD DRAWING 595 FIGURE COVERS KIPPLE	DATE: 12/20/11	A

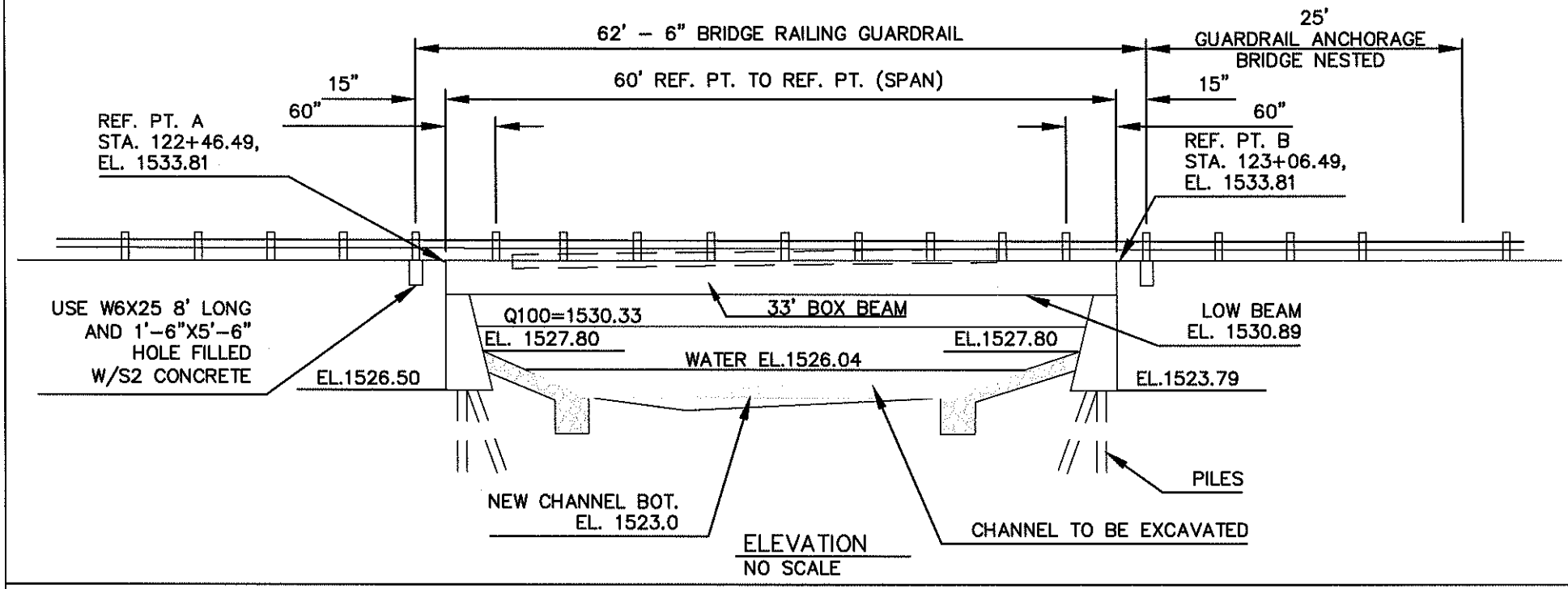


60' SPAN X 34'-3" WIDE
CONCRETE BOX BEAM BRIDGE

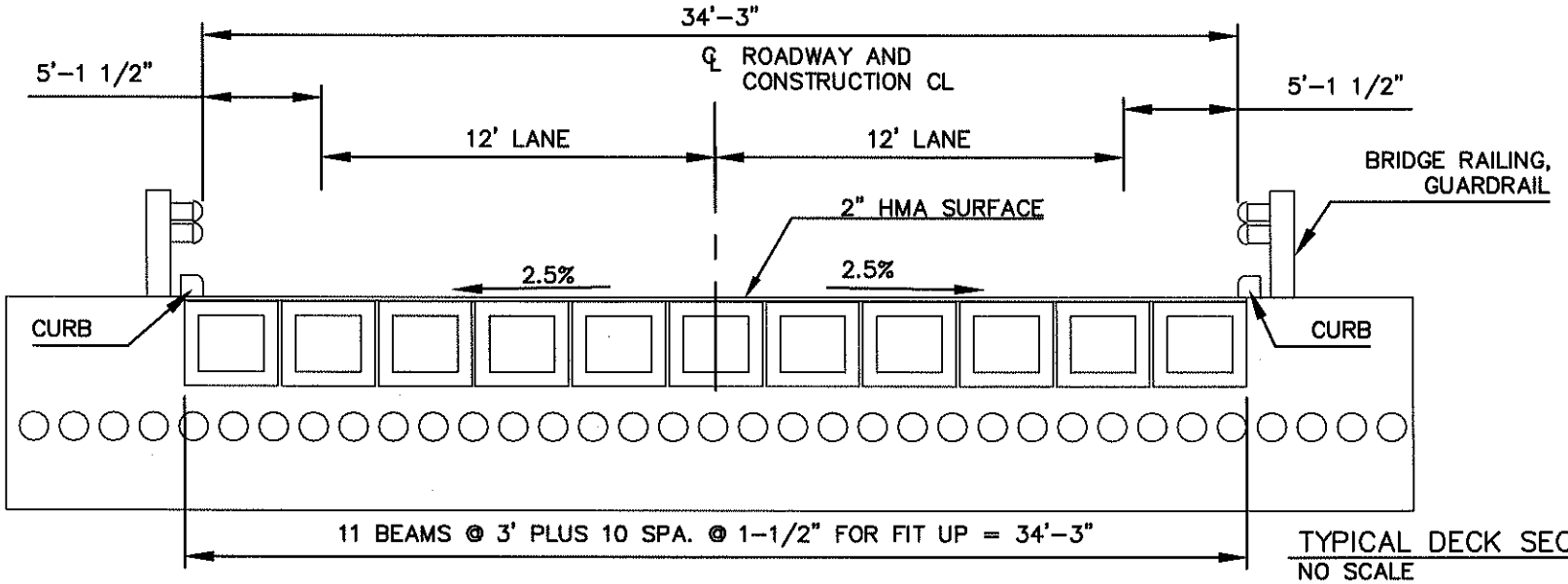
COLEMAN ENGINEERING COMPANY
635 CIRCLE DRIVE – IRON MOUNTAIN, MICHIGAN 49801 (906) 774-3440
200 EAST AYER STREET – IRONWOOD, MICHIGAN 49938 (906) 932-5048

MIDDLE BRANCH ESCANABA RIVER NEW BRIDGE
COUNTY ROAD 595 MARQUETTE COUNTY, MICHIGAN

CADD DRAWING	DATE:	
595 ESCANABA BRIDGE	12/16/11	1B



ELEVATION
NO SCALE



TYPICAL DECK SECTION
NO SCALE

COLEMAN ENGINEERING COMPANY
635 CIRCLE DRIVE – IRON MOUNTAIN, MICHIGAN 49801 (906) 774-3440
200 EAST AYER STREET – IRONWOOD, MICHIGAN 49938 (906) 932-5048

MIDDLE BRANCH ESCANABA RIVER NEW BRIDGE
COUNTY ROAD 595 MARQUETTE COUNTY, MICHIGAN

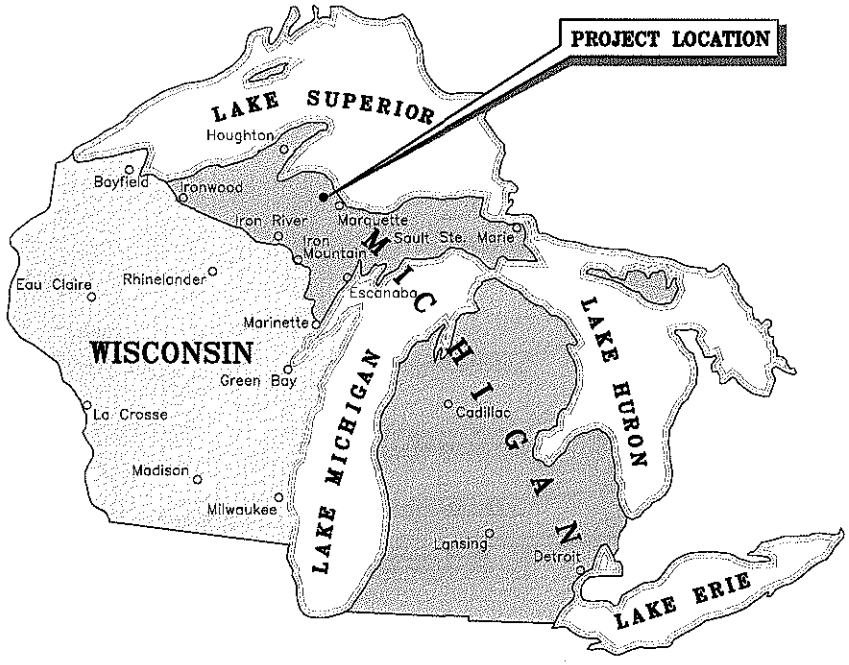
CADD DRAWING
595 ESCANABA
BRIDGE

DATE:
12/20/11

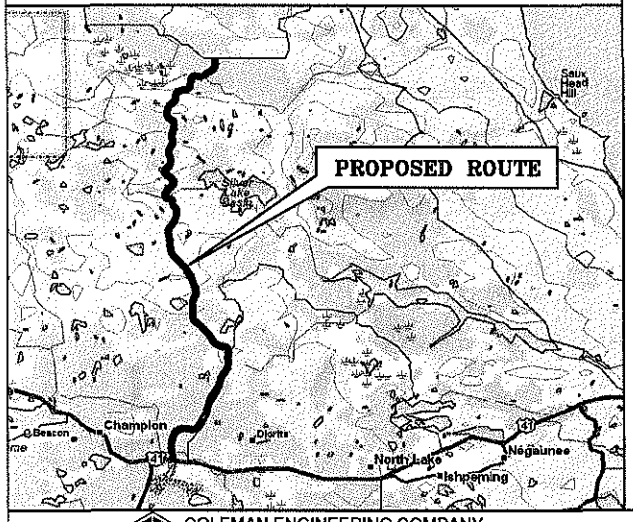
2B

COUNTY ROAD 595
PLAN AND PROFILE DRAWINGS

Wetlands



PROJECT LOCATION MAP



SHEET INDEX

PROFESSIONAL SEAL

DRAWN UNDER THE SUPERVISION OF:

PROJECT ENGINEER DATE

MARK GIRARD, P.E.
COLEMAN ENGINEERING COMPANY
635 CIRCLE DRIVE
IRON MOUNTAIN, MI 49801

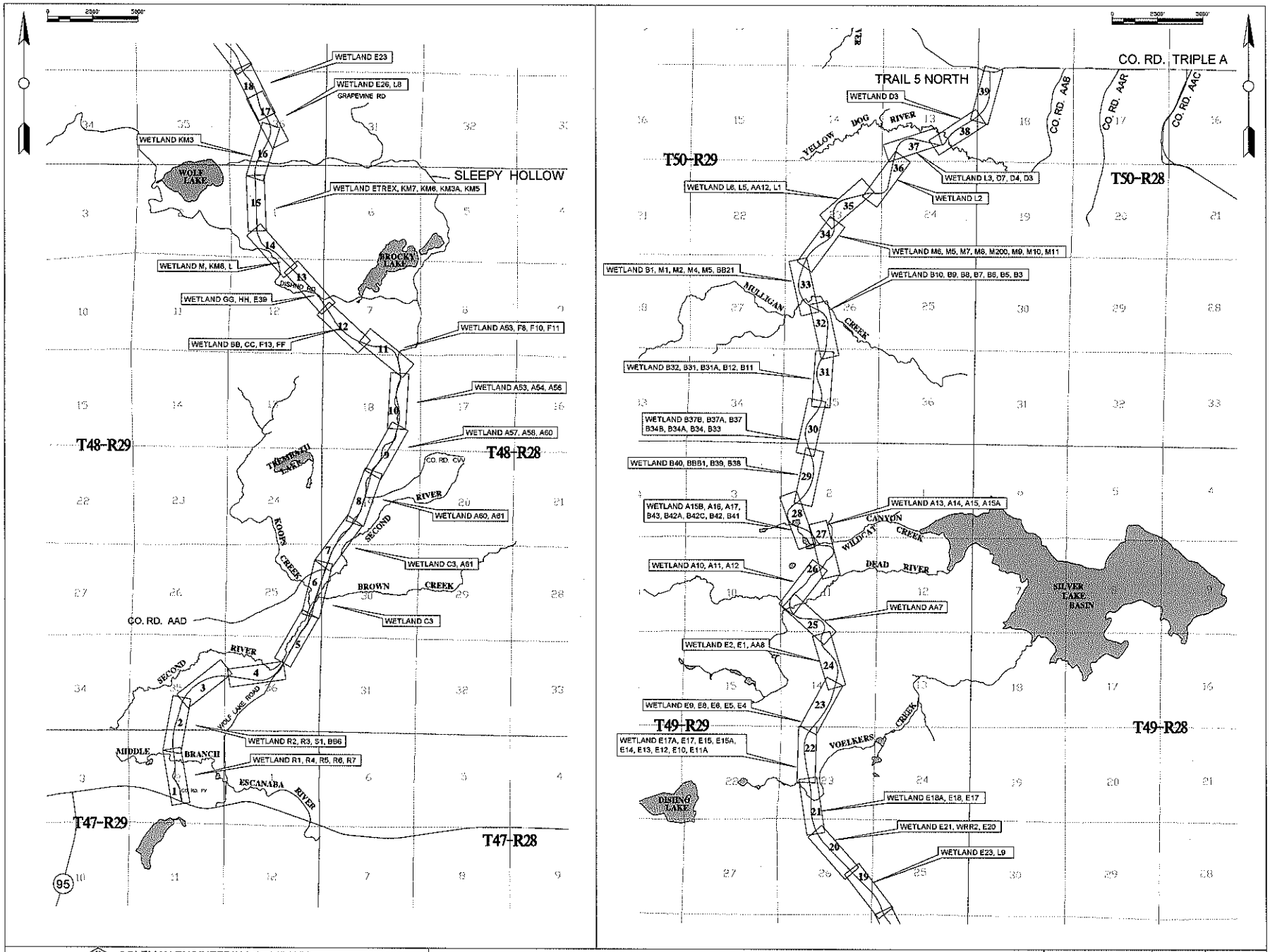
COLEMAN ENGINEERING COMPANY
635 CIRCLE DRIVE – IRON MOUNTAIN, MICHIGAN 49801 (906) 774-3440
200 EAST AYER STREET – IRONWOOD, MICHIGAN 49938 (906) 932-5048

COUNTY ROAD 595 MARQUETTE COUNTY, MICHIGAN

CADD DRAWING 595–COVER kipple

DATE: 1/13/12

A



COLEMAN ENGINEERING COMPANY
635 CIRCLE DRIVE – IRON MOUNTAIN, MICHIGAN 49801 (906) 774-3440
200 EAST AYER STREET – IRONWOOD, MICHIGAN 49938 (906) 932-5048

IMPACTED WETLAND INDEX
COUNTY ROAD 595 MARQUETTE COUNTY, MICHIGAN

CADD DRAWING: 595-WETLAND INDEX kipple
DATE: 9/28/11

B1

WATERSHED TOTALS AND MITIGATION REQUIRED

		MITIGATION REQUIRED
ESCANABA RIVER WATERSHED TOTAL =	**7.86**	**14.42**
WETLAND TYPE "EM" (1.5:1 RATIO)	0.55	0.82
WETLAND TYPE "EM/SS" (1.5:1 RATIO)	1.64	2.47
WETLAND TYPE "SS" (1.5:1 RATIO)	0.40	0.60
WETLAND TYPE "FO" (2:1 RATIO)	2.14	4.28
WETLAND TYPE "FO/SS" (2:1 RATIO)	2.29	4.57
WETLAND TYPE "FO/EM" (2:1 RATIO)	0.85	1.69
MICHIGAMME RIVER WATERSHED TOTAL =	**0.62**	**1.25**
WETLAND TYPE "EM" (1.5:1 RATIO)	0.00	0.00
WETLAND TYPE "EM/SS" (1.5:1 RATIO)	0.00	0.00
WETLAND TYPE "SS" (1.5:1 RATIO)	0.00	0.00
WETLAND TYPE "FO" (2:1 RATIO)	0.06	0.13
WETLAND TYPE "FO/SS" (2:1 RATIO)	0.56	1.12
WETLAND TYPE "FO/EM" (2:1 RATIO)	0.00	0.00
DEAD RIVER WATERSHED TOTAL =	**14.04**	**26.76**
WETLAND TYPE "EM" (1.5:1 RATIO)	0.57	0.86
WETLAND TYPE "EM/SS" (1.5:1 RATIO)	1.88	2.82
WETLAND TYPE "SS" (1.5:1 RATIO)	0.20	0.29
WETLAND TYPE "FO" (2:1 RATIO)	4.46	8.92
WETLAND TYPE "FO/SS" (2:1 RATIO)	4.65	9.29
WETLAND TYPE "FO/EM" (2:1 RATIO)	2.28	4.57
YELLOW DOG RIVER WATERSHED TOTAL =	**3.28**	**5.96**
WETLAND TYPE "EM" (1.5:1 RATIO)	0.19	0.28
WETLAND TYPE "EM/SS" (1.5:1 RATIO)	1.00	1.50
WETLAND TYPE "SS" (1.5:1 RATIO)	0.00	0.00
WETLAND TYPE "FO" (2:1 RATIO)	1.13	2.26
WETLAND TYPE "FO/SS" (2:1 RATIO)	0.00	0.00
WETLAND TYPE "FO/EM" (2:1 RATIO)	0.96	1.92
FALLS WATERSHED TOTAL =	**0.01**	**0.02**
WETLAND TYPE "EM" (1.5:1 RATIO)	0.00	0.00
WETLAND TYPE "EM/SS" (1.5:1 RATIO)	0.00	0.00
WETLAND TYPE "SS" (1.5:1 RATIO)	0.00	0.00
WETLAND TYPE "FO" (2:1 RATIO)	0.00	0.00
WETLAND TYPE "FO/SS" (2:1 RATIO)	0.00	0.00
WETLAND TYPE "FO/EM" (2:1 RATIO)	0.01	0.02
TOTAL =	**25.81**	**48.41**

Trail 5 Relocation - Tributary to Mulligan Creek Crossing

B14, INCLUDES CLEARING	Dead	EM/SS	360	0.01	

Trail 5 - Trib. To Mulligan Creek TOTAL = 360 0.01

Trail 5 Relocation - Mulligan Creek Crossing

B1	Dead	EM/SS	575		
B1	Dead	EM/SS	75	0.01	
B1, CLEARING	Dead	EM/SS	2,195	0.05	

Trail 5 - Mulligan Creek TOTAL = 2,270 0.05

Trail 5 Relocation - Yellow Dog RiverCrossing

D3	Yellow Dog	EM/SS	1,022		
D3	Yellow Dog	EM/SS	1,283	0.05	
D3, CLEARING	Yellow Dog	EM/SS	10,149	0.23	

Trail 5 - Yellow Dog River TOTAL = 12,454 0.29

Trail 5 GRAND TOTAL = 15,084 0.35

East Branch Salmon Trout River Stream Mitigation

Y1	Falls		14		
Y1	Falls		19		
Y1	Falls		71		
Y1	Falls		245		
Y1	Falls		61		
Y1	Falls		52	0.01	

EB Salmon Trout TOTAL = 462 0.01

CR 595 TOTAL = 1,108,760 25.45
(Includes Non-regulated Wetlands)

GRAND TOTAL = 1,124,306 25.81

WETLAND IMPACTS SCHEDULE

COUNTY ROAD 595 - WETLAND IMPACTS
5-Jan-2012
CR 595
*Nonregulated Wetland

Wetland Designation	Watershed	Wetland Type	Wetland Area Sq Ft	Sheet Total Acres	Sheet #
SOUTH 41	Escanaba	SS	1,241	0.03	M
R4	Escanaba	SS	5,642		
R5	Escanaba	SS	10,546		
R4	Escanaba	EM	2,732		
R6	Escanaba	EM/SS	1,057		
R7	Escanaba	EM	18		
R4	Escanaba	EM	2,612		
R1, COMP CUT	Escanaba	EM/SS	1,657		
R1	Escanaba	EM/SS	35,524	1.37	1
S1	Escanaba	FO/EM	1,660		
R2	Escanaba	EM	279		
*R3	Escanaba	EM	135		
*BB6	Escanaba	EM	3,714	0.13	2
—	—	—	—	—	None on Sht 3
—	—	—	—	—	None on Sht 4
—	—	—	—	—	None on Sht 5
C3	Escanaba	FO/SS	11,578		
C3	Escanaba	FO/SS	22,313		
C3	Escanaba	FO/SS	10,269		
C3	Escanaba	FO/SS	3,406	1.09	6
C3	Escanaba	FO/SS	1,093		
A61	Escanaba	FO/SS	6,012		
A61	Escanaba	FO/SS	15,969		
A61	Escanaba	FO/SS	126		
A61	Escanaba	FO/SS	2,076	0.58	7
A61	Escanaba	FO/SS	7,458		
A60	Escanaba	FO/EM	28,434		
A60	Escanaba	FO/EM	1,790	0.87	8
A60	Escanaba	FO/EM	610		
A58	Escanaba	FO/SS	15,169		
A58	Escanaba	FO/SS	4,075		
A58	Escanaba	FO/SS	0		
*A57	Escanaba	FO/EM	4,344	0.56	9
A56	Escanaba	EM	433		
A56	Escanaba	EM	7,980		
A54	Dead	FO/SS	2,052		
A54	Dead	FO/SS	4,923		
A54	Dead	FO/SS	15,137	0.80	10

COUNTY ROAD 595 - WETLAND IMPACTS
5-Jan-2012
CR 595
*Nonregulated Wetland

Wetland Designation	Watershed	Wetland Type	Wetland Area Sq Ft	Sheet Total Acres	Sheet #
A53	Dead	FO/SS	18,065		
A53	Dead	FO/SS	23,507		
A53	Dead	FO/SS	2,740		
F6	Dead	EM	38		
F7	Dead	EM	455		
F8	Dead	FO/EM	11,153	1.28	11
F10	Escanaba	FO	8,484		
F11	Escanaba	FO	0		
BB	Escanaba	EM	663		
CC	Escanaba	EM/SS	6,185		
F13	Escanaba	EM/SS/FO	2,121		
F13	Escanaba	EM/SS/FO	4,833	0.51	12
FF	Escanaba	EM/SS	6,477		
GG	Escanaba	EM	1,407		
HH	Escanaba	EM/SS	463		
E39	Escanaba	FO	7,811		
E39	Escanaba	FO	2,519	0.43	13
E39	Escanaba	FO	10,554		
E39	Escanaba	FO	23,373		
M	Escanaba	FO	17,261		
M	Escanaba	FO	0		
KM8	Escanaba	EM	1,159		
KM8	Escanaba	EM	2,637	1.26	14
L	Escanaba	EM/SS	18,180		
ETREX	Escanaba	EM/SS	2,049		
KM7	Escanaba	FO	5,454		
KM7	Escanaba	FO	3,733		
KM7	Escanaba	FO	732		
KM6	Escanaba	FO	3,447	0.86	15
KM6	Escanaba	FO	2,734		
KM3A	Escanaba	FO	0		
KM4	Escanaba	FO	56		
KM3	Dead	EM	952		
KM1-1	Dead	EM	215	0.09	16

WETLAND IMPACTS SCHEDULE

COUNTY ROAD 595 - WETLAND IMPACTS
5-Jan-2012
CR 595
*Nonregulated Wetland

Wetland Designation	Watershed	Wetland Type	Wetland Area Sq Ft	Sheet Total Acres	Sheet #
E26	Dead	FO/EM	3,241		
L8	Dead	FO	1,363		
L8	Dead	FO	2,102	0.15	17
E23	Michigamme	FO/SS	8,451		
E23	Michigamme	FO/SS	104		
E23	Michigamme	FO/SS	8,362		
E23	Michigamme	FO/SS	176	0.39	18
E23	Michigamme	FO/SS	0		
E23	Michigamme	FO/SS	7,322		
L9	Michigamme	FO	2,798	0.23	19
E21	Dead	FO/EM	0		
E21	Dead	FO/EM	0		
WRR2	Dead	FO/EM	0		
E20	Dead	FO/EM	3,288	0.08	20
E18A/E18	Dead	FO/EM	3,675		
E17	Dead	FO/EM	9,970		
E17	Dead	FO/EM	8,393	0.51	21
E17A	Dead	FO/EM	1,078		
E17	Dead	FO/EM	4,638		
E15	Dead	EM	469		
E15A	Dead	EM	4,692		
E14	Dead	FO	11,730		
E13	Dead	FO	3,638		
E12	Dead	EM	5,249		
E10	Dead	FO	324		
E11A	Dead	FO	1,416		
E10	Dead	FO	3,559	0.84	22
E9	Dead	FO/EM	11,842		
E8	Dead	FO	13,683		
E6	Dead	EM	73		
E5	Dead	FO/EM	4,882		
E4	Dead	EM	518	0.71	23

COUNTY ROAD 595 - WETLAND IMPACTS
5-Jan-2012
CR 595
*Nonregulated Wetland

Wetland Designation	Watershed	Wetland Type	Wetland Area Sq Ft	Sheet Total Acres	Sheet #
E2	Dead	FO/SS	22,618		
E2	Dead	FO/SS	22,858		
E1	Dead	FO	2,916		
E1	Dead	FO	12,334		
AA8	Dead	FO	0		
AA8	Dead	FO	0		
AA8	Dead	FO	0	1.39	24
AA7	Dead	FO/SS	12,059	0.28	25
A10, COMP CUT	Dead	EM/SS	1,299		
A10	Dead	EM/SS	15,630		
A10	Dead	EM/SS	0		
A10	Dead	EM/SS	9,005		
A11	Dead	FO	7,312		
A12	Dead	FO	21,369	1.25	26
A13	Dead	FO	22,953		
A14	Dead	EM	390		
A15	Dead	FO/SS	0		
A15	Dead	FO/SS	8,494		
A15A	Dead	FO/SS	3,588		
A15	Dead	FO/SS	8,037	1.00	27
A15B	Dead	FO/SS	0		
A16	Dead	FO/SS	2,864		
A16	Dead	FO/SS	6,319		
A17	Dead	FO/SS	21,153		
B43	Dead	FO/EM	4,847		
B42A	Dead	EM	0		
B42C	Dead	EM	506		
B42	Dead	FO	1,097		
B41	Dead	EM/SS	7,995		
B41	Dead	EM/SS	6,694	1.18	28
B40	Dead	EM/SS	12,773		
BBB1	Dead	FO	22,522		
B39	Dead	FO	2,064		
B39	Dead	FO	0		
B38	Dead	FO	17,542		
B38	Dead	FO	2,426		
B38	Dead	FO	6,695	1.47	29

WETLAND IMPACTS SCHEDULE

COUNTY ROAD 595 - WETLAND IMPACTS
5-Jan-2012
CR 595
***Nonregulated Wetland**

Wetland Designation	Watershed	Wetland Type	Wetland Area Sq Ft	Sheet Total Acres	Sheet #
B37B	Dead	EM	2,689		
B37A	Dead	EM	0		
B37	Dead	FO/EM	10,007		
B34B	Dead	FO/EM	5,171		
B34A	Dead	FO/EM	603		
B34	Dead	FO/EM	3,991		
B33	Dead	FO	10,183	0.75	30
B32	Dead	FO	1,428		
B31/B31A	Dead	FO/EM	6,047		
B31	Dead	FO/EM	0		
B31	Dead	FO/EM	6,667		
B12	Dead	EM	2,783		
B11	Dead	EM	4,135	0.48	31
B10	Dead	EM/SS	1,029		
B9	Dead	FO/SS	9,942		
B8	Dead	FO/SS	7,200		
B7	Dead	SS	4,486		
B6	Dead	FO/SS	5,218		
B5	Dead	FO	4,017		
B3	Dead	FO/SS	5,600	0.86	32
B1	Dead	EM/SS	7,709		
B1	Dead	EM/SS	17,167		
B1	Dead	EM/SS	0		
M1	Dead	FO	6,050		
M2	Dead	FO	7,847		
*M4	Dead	SS	4,038		
M5	Dead	FO	6,324		
BB21	Dead	FO	0	1.13	33
M6	Dead	EM	1,784		
M5	Dead	FO	0		
M7	Dead	FO	1,377		
M8	Yellow Dog	FO	12,504		
M200	Yellow Dog	FO	1,841		
M9	Yellow Dog	EM	3,857		
M10	Yellow Dog	EM	4,216		
M11	Yellow Dog	FO	12,721	0.88	34

COUNTY ROAD 595 - WETLAND IMPACTS
5-Jan-2012
CR 595
***Nonregulated Wetland**

Wetland Designation	Watershed	Wetland Type	Wetland Area Sq Ft	Sheet Total Acres	Sheet #
L6	Yellow Dog	FO	1,588		
L6	Yellow Dog	FO	2,029		
L5	Yellow Dog	FO	1,308		
AA12	Yellow Dog	FO	7,451		
L1	Yellow Dog	FO	9,835	0.51	35
L2	Yellow Dog	FO/EM	8,462		
L2	Yellow Dog	FO/EM	2,680		
L2	Yellow Dog	FO/EM	3,878		
L2	Yellow Dog	FO/EM	4,645		
L2	Yellow Dog	FO/EM	4,215		
L2	Yellow Dog	FO/EM	10,063		
L2	Yellow Dog	FO/EM	1,935		
L2	Yellow Dog	FO/EM	5,817		
L2	Yellow Dog	FO/EM	0	0.96	36
L3	Yellow Dog	FO/EM	0		
D7	Yellow Dog	FO/EM	69		
D4	Yellow Dog	EM/SS	0		
D3	Yellow Dog	EM/SS	5,172	0.12	37
D3	Yellow Dog	EM/SS	26,066		
D3	Yellow Dog	EM/SS	0	0.60	38
—	—	—	—	—	None on sht 39

***Nonregulated Wetland**

CR 595 TOTAL = **1,108,760** **25.45**
(Includes Non-regulated Wetlands)

COUNTY ROAD 595 - WETLAND CROSS SECTION SUMMARY

12-Jan-2012

CR 595

*Nonregulated Wetland

Wetland Designation	Watershed	Wetland Type	Wetland Cross Section Number	Wetland Cross Section Station	Wetland Excavation Cu Yd	Wetland Fill Cu Yd	Cross Section Sheet #	Plan Sheet #
SOUTH 41	Escanaba	SS	W-US41-1		166.7	533.3	1A	M
R4	Escanaba	SS	W-R5-1/R4-1	101+00	33.5	60.0	1B	
R5	Escanaba	SS			91.5	207.0	1B	
R6	Escanaba	EM/SS	W-R6-1/R4-2	105+00	39.0	61.0	2	
R4	Escanaba	EM			120.0	375.6	2	
R4	Escanaba	EM	W-R4-3	113+00	116.7	124.4	3	
R1	Escanaba	EM/SS	W-R1-1	122+00	520.0	1,915.6	4	
R1	Escanaba	EM/SS	W-R1-2	125+00	427.7	5,644.4	5	1
S1	Escanaba	FO/EM	W-S1-1	134+25	31.4	281.5	6	
R2	Escanaba	EM	W-R2-1	135+00	8.3	18.3	7	
*R3	Escanaba	EM	W-R3-1	136+00	23.7	26.7	8	
*BB6	Escanaba	EM	W-BB6-1	142+15	190.7	1,603.7	9	2
								None on Sht 3
								None on Sht 4
								None on Sht 5
C3	Escanaba	FO/SS	W-C3-1	259+00	1,019.4	3,238.9	10	
C3	Escanaba	FO/SS	W-C3-2	261+00	718.6	1,214.9	11	
C3	Escanaba	FO/SS	W-C3-3	277+00	1,518.5	3,037.0	12	6
C3	Escanaba	FO/SS	W-C3-4	280+50	2.3	4.6	13	
A61	Escanaba	FO/SS	W-A61-1	290+00	575.0	1,635.6	14	
A61	Escanaba	FO/SS	W-A61-2	297+00	733.3	3,017.4	15	
A61	Escanaba	FO/SS	W-A61-3	303+00	2.8	0.0	16	
A61	Escanaba	FO/SS	W-A61-4	307+00	31.1	98.5	17	7
A61	Escanaba	FO/SS	W-A61-5	312+00	240.7	2,055.9	18	
A60	Escanaba	FO/EM	W-A60-1	333+00	2,150.0	7,451.3	19	
A60	Escanaba	FO/EM	W-A60-2	339+00	159.3	418.5	20	8
A58	Escanaba	FO/SS	W-A58-1	358+00	6,111.1	7,953.7	21	
A58	Escanaba	FO/SS	W-A58-2	361+50	1,616.7	2,095.9	22	
*A57	Escanaba	FO/EM	W-A57-1	368+50	1,071.3	244.4	23	9
A56	Escanaba	EM	W-A56-1	374+00	279.6	3,074.1	24	
A54	Dead	FO/SS	W-A54-1	385+00	93.3	397.8	25	
A54	Dead	FO/SS	W-A54-2	387+00	280.0	1,000.0	26	
A54	Dead	FO/SS	W-A54-3	391+50	2,219.4	4,714.4	27	10
A53	Dead	FO/SS	W-A53-1	399+00	115.7	875.0	28	
A53	Dead	FO/SS	W-A53-2	402+00	270.8	1,008.3	29	
A53	Dead	FO/SS	W-A53-3	405+50	283.3	1,050.0	30	
A53	Dead	FO/SS	W-A53-4	409+50	142.0	672.8	31	
A53	Dead	FO/SS	W-A53-5	412+50	466.7	303.3	32	
F6	Dead	FO/EM	W-F6-1	413+75	0.8	0.0	33	
F7	Dead	FO	W-F7-1	414+75	13.0	0.0	34	
F8	Dead	FO	W-F8-1	420+50	200.0	1,458.5	35	11
F10	Dead	EM	W-F10-1	426+75	222.2	6,100.0	36	
BB	Escanaba	EM/SS	W-BB-1	438+75	39.8	7.9	37	
CC	Escanaba	EM/SS/FO	W-CC-1	441+75	156.7	1,773.3	38	
F13	Escanaba	EM/SS/FO	W-F13-1	448+50	74.1	668.1	39	
F13	Escanaba	EM/SS	W-F13-2	453+25	94.4	1,320.8	40	12
FF	Escanaba	EM/SS	W-FF-1	455+00	100.0	1,035.1	41	
FF	Escanaba	EM	W-FF-1	456+75	7.8	26.7	42	
GG	Escanaba	EM/SS	W-GG-1	464+00	618.9	70.0	43	
HH	Escanaba	FO	W-HH-1	474+00	12.5	59.7	44	
E39	Escanaba	FO	W-E39-1	477+25	155.6	1,708.3	45	
E39	Escanaba	FO	W-E39-2	479+75	344.4	22.2	46	
E39	Escanaba	FO	W-E39-3	481+25	538.9	50.0	47	13
E39	Escanaba	FO	W-E39-4	485+00	2,033.3	661.1	48	
E39	Escanaba	FO	W-E39-5	491+00	511.6	10,002.8	49	
M	Escanaba	FO	W-M-1	499+75	737.0	881.5	50	
M	Escanaba	FO	W-M-2	502+00	138.9	1,733.8	51	
KM8	Escanaba	EM	W-KM8-1	509+25	94.8	91.1	52	
KM8	Escanaba	EM	W-KM8-2	510+75	174.1	235.1	53	14
L	Escanaba	EM/SS	W-L-1	515+00	254.6	2,601.9	54	
L	Escanaba	EM/SS	W-L-2	517+25	52.8	822.2	55	
ETREX	Escanaba	EM/SS	W-ETREX-1	526+00	33.3	327.8	56	
KM7	Escanaba	FO	W-KM7-1	531+75	102.2	766.7	57	
KM7	Escanaba	FO	W-KM7-2	533+25	226.7	264.4	58	
KM7	Escanaba	FO	W-KM7-3	537+00	204.2	69.4	59	
KM6	Escanaba	FO	W-KM6-1	539+25	60.2	683.3	59A	15
KM6	Escanaba	FO	W-KM6-2	543+25	53.3	397.8	59B	
KM3	Dead	FO	W-KM3-1	551+00	113.0	21.3	59C	
KM1	Dead	EM	W-KM1-1	555+35	3.7	55.2	59D	16
E26	Dead	FO/EM	W-E26-1	580+10	55.6	867.8	59E	
L8	Dead	FO	W-L8-1	586+25	486.7	53.3	59F	
L8	Dead	FO	W-L8-2	587+00	404.1	63.3	59G	17
E23	Michigamme	FO/SS	W-E23-1	1126+50	1,813.0	5,828.0	60	
E23	Michigamme	FO/SS	W-E23-2	1131+00	925.6	2,566.7	61	18
E23	Michigamme	FO/SS	W-E23-3	1148+75	840.7	2,766.7	62	
L9	Michigamme	FO	W-L9-1	1154+25	246.3	150.5	63	19
E20	Dead	FO/EM	W-E20-1	1197+70	72.2	1,212.0	63A	20
E18A/E18	Dead	FO/EM	W-E18A-1/E18-1	1206+40	69.4	1,702.2	63B	
E17	Dead	FO/EM	W-E17-1	1219+84	51.1	591.5	64	
E17	Dead	FO/EM	W-E17-2	1225+50	330.6	2,097.2	65	21
E17A	Dead	EM	W-E17A-1	1237+60	15.0	222.2	65A	
E15	Dead	EM	W-E15-1/E15A-1	1244+50	13.5	2.7	66	
E15A					509.3	335.1		
E14	Dead	FO	W-E14-1	1250+40	620.4	2,613.4	67	
E13	Dead	FO	W-E13-1	1254+12	18.3	74.4	68	
E12	Dead	EM	W-E12-1	1259+10	120.4	1,194.4	69	
E11A	Dead	EM	W-E11A-1	1261+00	41.1	253.9	69A	
E10	Dead	FO	W-E10-1	1263+70	54.6	442.6	70	22

E9	Dead	FO/EM	W-E9-1	1268+70	152.6	3,340.7	71	
E8	Dead	FO	W-E8-1	1272+00	1,890.0	6,996.7	72	
E5	Dead	FO/EM	W-E5-1	1280+83	477.8	225.0	73	
E4	Dead	EM	W-E4-1	1285+00	5.0	35.0	74	23
E2	Dead	FO/SS	W-E2-1	1300+50	991.9	9,138.5	75	
E2	Dead	FO/SS	W-E2-2	1304+25	2,404.6	6,961.1	76	
E1	Dead	FO	W-E1-1	1308+30	394.4	990.7	77	
E1	Dead	FO	W-E1-2	1313+50	1,594.4	4,464.4	78	24
AA7	Dead	FO/SS	W-AA7-1	1343+50	229.4	2,574.4	79	25
A10	Dead	EM/SS	W-A10-1	1353+45	1,820.0	7,243.3	80	
A10	Dead	EM/SS	W-A10-2	1359+15	83.3	3,988.8	81	
A11	Dead	FO	W-A11-1	1366+00	2,561.1	259.3	82	
A12	Dead	FO	W-A12-1	1374+40	1,193.7	8,865.2	83	26
A13	Dead	FO	W-A13-1	1385+50	2,349.1	3,620.4	84	
A13	Dead	FO	W-A13-2	1388+40	1,347.2	1,713.0	85	
A14	Dead	EM	W-A14-1	1396+50	5.6	56.9	85A	
A15	Dead	FO/SS	W-A15-1	1403+60	554.7	2,853.3	86	
A15A	Dead	FO/SS	W-A15A-1	1406+60	478.2	151.4	87	
A15	Dead	FO/SS	W-A15-2	1408+65	243.9	46.7	88	27
A16	Dead	FO/SS	W-A16-1	1418+50	655.9	4,819.4	89	
A17	Dead	FO/SS	W-A17-1	1423+50	994.8	7,498.9	90	
B43	Dead	FO/EM	W-B43-1	1430+50	27.8	680.1	91	
B42	Dead	FO	W-B42-1	1435+50	252.2	71.1	92	
B41	Dead	EM/SS	W-B41-1	1437+50	1,227.8	6,148.5	93	28
B40	Dead	EM/SS	W-B40-1	1444+50	2,125.2	2,934.4	94	
B40	Dead	EM/SS	W-B40-2	1448+56	219.2	97.8	95	
BBB1	Dead	FO	W-BBB1-1	1452+65	5,588.1	1,686.7	96	
B39	Dead	FO	W-B39-1	1456+14	224.1	118.5	97	
B38	Dead	FO	W-B38-1	1460+00	5,632.3	12,159.8	98	
B38	Dead	FO	W-B38-2	1464+18	177.8	875.6	99	
B38	Dead	FO	W-B38-3	1466+57	2,370.4	3,635.6	100	29
B37B	Dead	FO/EM	W-B37B-1	1472+10	31.5	283.3	100A	
B37	Dead	FO/EM	W-B37-1	1475+75	2,061.5	4,391.9	101	
B34B	Dead	FO/EM	W-B34B-1	1485+50	95.6	1,755.6	101A	
B34	Dead	FO/EM	W-B34-1	1488+20	38.4	772.7	102	
B33	Dead	FO	W-B33-1	1496+30	496.7	6,431.7	103	30
B32	Dead	FO	W-B32-1	1506+75	31.1	544.1	104	
B31	Dead	FO/EM	W-B31-1	1510+50	272.6	2,112.6	105	
B31A	Dead	FO/EM	W-B31A-1	1510+90	19.4	166.7	105A	
B31	Dead	FO/EM	W-B31-2	1515+75	434.4	3,192.2	106	
B12	Dead	EM	W-B12-1	1522+75	77.0	1,413.3	107	
B11	Dead	EM	W-B11-1	1527+40	85.2	1,188.0	108	31
B10	Dead	EM/SS	W-B10-1	1531+65	13.3	211.5	109	
B9	Dead	FO/SS	W-B9-1	1533+75	770.0	2,846.7	110	
B8	Dead	FO/SS	W-B8-1	1540+50	1,273.2	206.5	111	
B7	Dead	SS	W-B7-1	1543+25	118.5	1,090.7	112	
B6	Dead	FO/SS	W-B6-1	1545+75	545.0	1,191.7	113	
B5	Dead	FO/SS	W-B5-1	1547+00	56.7	724.7	113A	
B3	Dead	FO/SS	W-B3-1	1556+73	135.8	799.3	114	32
B1	Dead	EM/SS	W-B1-1	1560+35	271.7	3,371.7	115	
B1	Dead	EM/SS	W-B1-2	1564+20	1,361.1	7,987.8	116	
M1	Dead	FO	W-M1-1	1579+05	194.4	2,150.6	117	
M2	Dead	FO	W-M2-1	1583+20	746.7	1,273.3	118	
*M4	Dead	SS	W-M4-1	1585+30	688.9	355.6	119	
M5	Dead	FO	W-M5-1	1588+30	117.6	214.8	120	33
M6	Dead	EM	W-M6-1	1590+85	32.8	141.7	121	
M7	Dead	FO	W-M7-1	1592+35	18.9	251.9	122	
M8	Yellow Dog	FO	W-M8-1	1597+75	404.4	1,728.5	123	
M9	Yellow Dog	EM	W-M9-1	1604+00	92.6	481.5	124	
M10	Yellow Dog	EM	W-M10-1	1608+75	138.9	1,242.2	125	
M11	Yellow Dog	FO	W-M11-1	1612+20	1,136.5	4,095.6	126	34
L6	Yellow Dog	FO	W-L6-1	1620+75	30.6	803.7	127	
L5	Yellow Dog	FO	W-L5-1	1623+80	1.9	3.7	128	
AA12	Yellow Dog	FO	W-AA12-1	1632+50	183.7	2,450.4	129	
L1	Yellow Dog	FO	W-L1-1	1643+75	182.2	5,302.2	130	35
L2	Yellow Dog	FO/EM	W-L2-1	1649+40	68.7	1,221.1	131	
L2	Yellow Dog	FO/EM	W-L2-2	1652+00	89.6	1,061.3	132	
L2	Yellow Dog	FO/EM	W-L2-3	1654+25	77.1	634.4	133	
L2	Yellow Dog	FO/EM	W-L2-4	1656+50	112.6	565.9	134	
L2	Yellow Dog	FO/EM	W-L2-5	1663+25	2,022.2	3,877.8	135	
L2	Yellow Dog	FO/EM	W-L2-6	1666+15	121.1	150.4	136	
L2	Yellow Dog	FO/EM	W-L2-7	1667+75	65.3	564.2	137	36
D7	Yellow Dog	FO/EM	W-D7-1	1692+43	1.9	0.0	139	37
D3	Yellow Dog	EM/SS	W-D3-1	1704+50	636.5	452.8	140	
D3	Yellow Dog	EM/SS	W-D3-2	1709+50	178.0	1,159.6	141	
D3	Yellow Dog	EM/SS	W-D3-3	1712+50	622.2	3,733.3	142	38
								None on sht 39

*Nonregulated Wetland

CR 595 TOTAL = **90,357** **291,808**

(Includes Non-regulated Wetlands)

WETLAND EQUALIZATION CULVERT SCHEDULE

16-Dec-2011

Box culverts use wingwalls as entrance treatment. All round culverts use apron endwalls.

Culvert Designation	RCP Diameter Inches	Length Feet	Centerline Station	Invert Left Feet	Invert Right Feet	Existing Culvert To Be Replaced Inches	Cross Section Sheet #	Plan Sheet #	Riprap Volume 1' Depth CYD
E3	24	82	100+70	1531.00	1530.59	24	1	1	11.9
E3A	9'x4' BOX	46	121+50	1525.20	1524.97	None	1A	1	16.3
E3B	9'x4' BOX	45	122+00	1525.55	1524.67	None	1B	1	16.3
E3C	9'x4' BOX	45	123+50	1525.53	1525.31	None	1C	1	16.3
E3D	9'x4' BOX	45	124+00	1525.15	1524.95	None	1D	1	16.3
E4	30	63	289+50	1560.34	1561.36	12	2	7	13.0
E5	42	72	297+51	1561.28	1561.10	15	3	7	15.2
E5A	18	51	307+25	1569.72	1569.47	None	3A	7	10.7
E7	30	67	333+50	1613.80	1613.93	15	4	8	13.0
E8	18	59	357+00	1677.07	1677.44	12	5	9	10.7
E9	18	69	361+25	1679.15	1682.75	None	6	9	10.7
E10	30	92	374+00	1724.81	1720.64	20	7	10	13.0
D1	24	183	387+32	1735.70	1731.03	20	8	10	11.9
D2	30	58	393+00	1725.58	1724.79	20	9	10	13.0
D100	18	45	401+00	1714.73	1714.65	12	10	11	10.7
D101	18	44	405+50	1716.69	1716.69	None	11	11	10.7
D102	24	48	409+50	1717.79	1717.12	None	12	11	11.9
D103	24	50	420+00	1722.81	1723.48	None	13	11	11.9
E100	24	48	442+00	1707.72	1706.71	None	14	12	11.9
E101	24	50	448+50	1683.95	1684.99	None	15	12	11.9
E103	24	54	455+00	1668.18	1667.02	None	16	13	11.9
E104	24	56	477+25	1692.87	1694.35	None	17	13	11.9
E106	24	45	499+90	1712.42	1712.42	None	18	14	11.9
E107	24	59	501+75	1716.95	1714.92	None	19	14	11.9
E108	24	56	515+50	1709.82	1708.71	None	19A	15	11.9
E110	24	60	526+00	1727.73	1729.86	None	19B	15	11.9
E111	24	47	531+75	1745.55	1746.63	None	19C	15	11.9
E112	24	87	539+25	1755.00	1767.13	None	19D	15	11.9
E113	24	56	543+00	1774.91	1773.22	None	19E	16	11.9
D107	24	62	580+10	1708.58	1704.73	None	19F	17	11.9
M1A	30	94	1126+37	1737.69	1736.16	None	20	18	13.0
M2	30	74	1149+00	1728.55	1728.68	None	21	19	13.0
D26	24	95	1197+65	1801.67	1800.47	8	21A	20	11.9
D27	36	140	1206+43	1785.59	1777.40	8	21B	21	14.1
D30	18	67	1250+47	1741.27	1740.97	None	22	22	10.7
D31	18	116	1268+55	1751.75	1752.00	12	23	23	10.7
D33	24	88	1300+88	1586.61	1585.29	12	24	24	11.9
D34	18	67	1303+92	1584.65	1585.13	None	25	24	10.7
D36	30	75	1314+01	1583.24	1582.39	18	26	24	13.0
D39	18	52	1344+00	1570.86	1570.89	None	27	25	10.7
D42	42	118	1374+81	1638.20	1634.12	15	28	26	15.2
D43	18	69	1387+90	1685.86	1684.89	None	28A	27	10.7
D45	18	81	1409+50	1680.65	1684.12	None	29	27	10.7
D49	18	96	1437+20	1743.88	1745.90	12	30	28	10.7
D50	18	46	1445+54	1772.37	1772.75	15	31	29	10.7
D51	24	78	1460+59	1768.34	1768.27	None	32	29	11.9
D52	18	79	1464+02	1769.68	1770.77	12	33	29	10.7
D53	24	64	1467+00	1777.12	1776.80	12	34	29	11.9
D54	24	53	1475+02	1790.09	1790.37	12	35	30	11.9
D55	18	108	1488+19	1785.25	1781.72	None	36	30	10.7
D56	18	120	1496+50	1753.28	1747.67	None	37	30	10.7
D58	24	83	1510+79	1707.03	1704.52	12	37A	31	11.9
D62	42	58	1533+35	1695.72	1694.63	None	38	32	15.2
D63	18	87	1543+09	1707.74	1708.09	None	39	32	10.7
D63A	18	47	1545+75	1719.75	1721.04	None	39A	32	10.7
D65	18	89	1560+53	1683.37	1679.62	None	40	33	10.7
D66	18	104	1579+11	1750.90	1745.70	None	41	33	10.7
D66A	18	52	1583+00	1765.25	1765.25	None	41A	33	10.7
Y1	18	102	1604+29	1727.97	1743.90	None	42	34	10.7
Y2	24	46	1608+77	1710.17	1710.54	None	43	34	11.9
Y3	18	74	1612+00	1702.59	1702.57	None	44	34	10.7
Y10	18	120	1646+09	1455.66	1459.27	None	45	36	10.7
Y11	18	50	1654+22	1438.38	1438.92	None	46	36	10.7
Y12	18	53	1663+62	1432.85	1432.92	None	47	36	10.7
Y13	18	51	1667+45	1433.28	1433.18	None	48	36	10.7

Total Number of Culverts = 65

UPLAND DRAINAGE AND WETLAND EQUALIZATION CULVERT SCHEDULE

14-Nov-2011

Roadway design must include proper drainage to prevent the roadbed from becoming saturated. A saturated roadbed will not be structurally able to withstand traffic loading and will be subject to severe damage, especially during freezing/thawing conditions. The proposed design of CR 595 incorporates a drainage system including ditches and culverts to protect the roadbed from saturation. The following culvert schedule lists both the upland drainage culverts and wetland equalization culverts.

Upland drainage culverts will be installed in uplands (non-wetland) to protect the roadbed and also to maintain current surface water runoff patterns. Cross sections for upland drainage culverts that are not in a wetland area are not required and are not provided. Upland drainage culverts that are located partially in wetland do have cross sections provided.

Wetland equalization culverts will be installed wherever the roadway alignment runs through a wetland. This may involve a wetland being bisected by the proposed road, or a wetland whose surface water source would be cut off by the proposed road. To prevent this, the proposed design includes equalization culverts in wetland areas. These equalization culverts are designed to protect the roadbed from saturation, and are located in or adjacent to wetlands to maintain surface water continuity.

The culvert schedule below lists both the upland drainage culverts and wetland equalization culverts.

The letter prefixes for culvert designations are based on what watershed each culvert is located in.
E = Escanaba River. D = Dead River. M = Michigamme River. Y = Yellow Dog River.

UPLAND DRAINAGE CULVERT SCHEDULE

14-Nov-2011

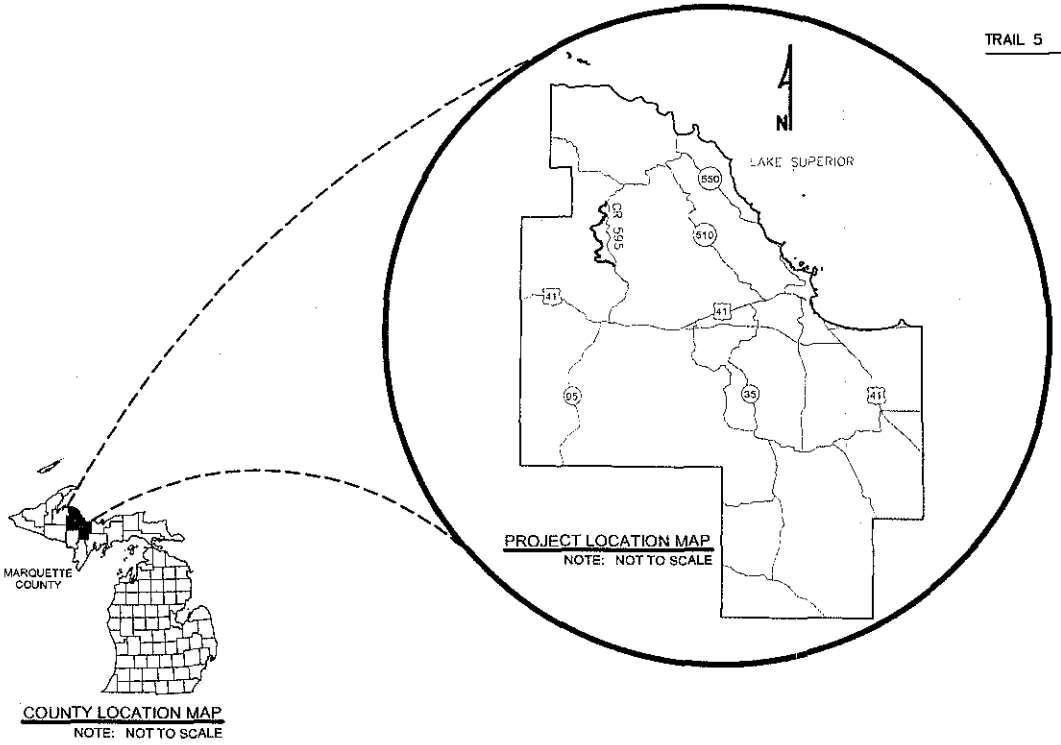
All culverts use apron endwalls as entrance treatment.

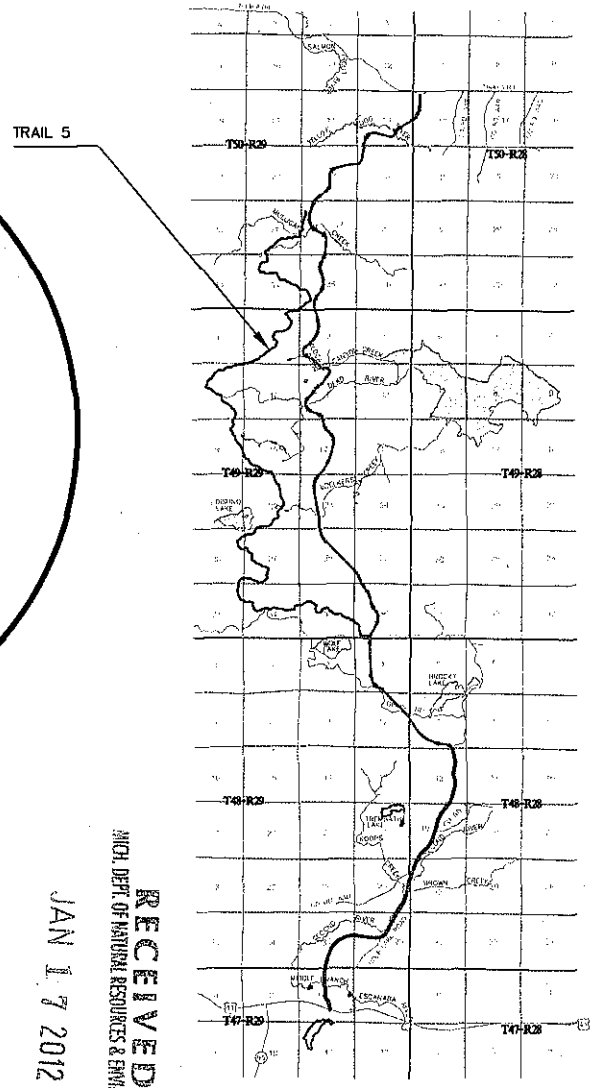
Culvert Designation	Size Inches	Length Feet	Centerline Station	Invert Left Feet	Invert Right Feet	Existing Culvert To Be Replaced Inches	Cross Section Sheet #	Plan Sheet #	Riprap Volume 1' Depth CYD
D1A	18	80	380+72			None		10	10.7
D105	24	58	571+50			None		16	11.9
D106	24	125	575+00			None		16	11.9
*D32	24	90	1273+98	1738.97	1732.05	15	1	23	11.9
*D35	18	55	1308+60	1584.72	1585.25	None	2	24	10.7
*D41	18	135	1359+62	1565.37	1588.75	None	3	26	10.7
Y4	18	95	1620+00			None		35	10.7
Y5	18	70	1625+00			None		35	10.7
Y6	18	90	1630+00			None		35	10.7
Y7	18	65	1635+00			None		35	10.7
Y8	18	65	1640+00			None		35	10.7
*Y9	18	117	1645+02	1458.86	1466.92	None	4	35	10.7
								TOTAL =	**132.2**

Total Number of Culverts Partially in Wetland = 4

*Upland drainage culverts that are located partially in a wetland. Cross sections provided.

TRAIL 5 RELOCATION





NOTE:
TRAIL 5 RELOCATION PERMIT FOR WETLAND IMPACTS AND STREAM CROSSINGS TO BE APPLIED FOR SEPARATELY. PLAN SET PROVIDED FOR REFERENCE ONLY FOR CR 595 MITIGATION PURPOSES

RECEIVED
MICH. DEPT. OF NATURAL RESOURCES & ENVIRONMENT
JAN 17 2012
WATER RESOURCES DIVISION

COLEMAN ENGINEERING COMPANY 635 CIRCLE DRIVE – IRON MOUNTAIN, MICHIGAN 49801 (906) 774-3440 200 EAST AYER STREET – IRONWOOD, MICHIGAN 49938 (906) 932-5048	WETLAND IMPACTS FOR TRAIL 5 RELOCATION STREAM MITIGATION PROJECT	CADD DRAWING 595 FIGURE COVERS KIPPLE	DATE: 12/19/11	A

Trail 5 Relocation - Tributary to Mulligan Creek Crossing

B14, INCLUDES CLEARING	Dead	EM/SS	360	0.01	

Trail 5 - Trib. To Mulligan Creek TOTAL = 360 0.01

Trail 5 Relocation - Mulligan Creek Crossing

B1	Dead	EM/SS	575		
B1	Dead	EM/SS	75	0.01	
B1, CLEARING	Dead	EM/SS	2,195	0.05	

Trail 5 - Mulligan Creek TOTAL = 2,270 0.05

Trail 5 Relocation - Yellow Dog RiverCrossing

D3	Yellow Dog	EM/SS	1,022		
D3	Yellow Dog	EM/SS	1,283	0.05	
D3, CLEARING	Yellow Dog	EM/SS	10,149	0.23	

Trail 5 - Yellow Dog River TOTAL = 12,454 0.29

Trail 5 GRAND TOTAL = 15,084 0.35

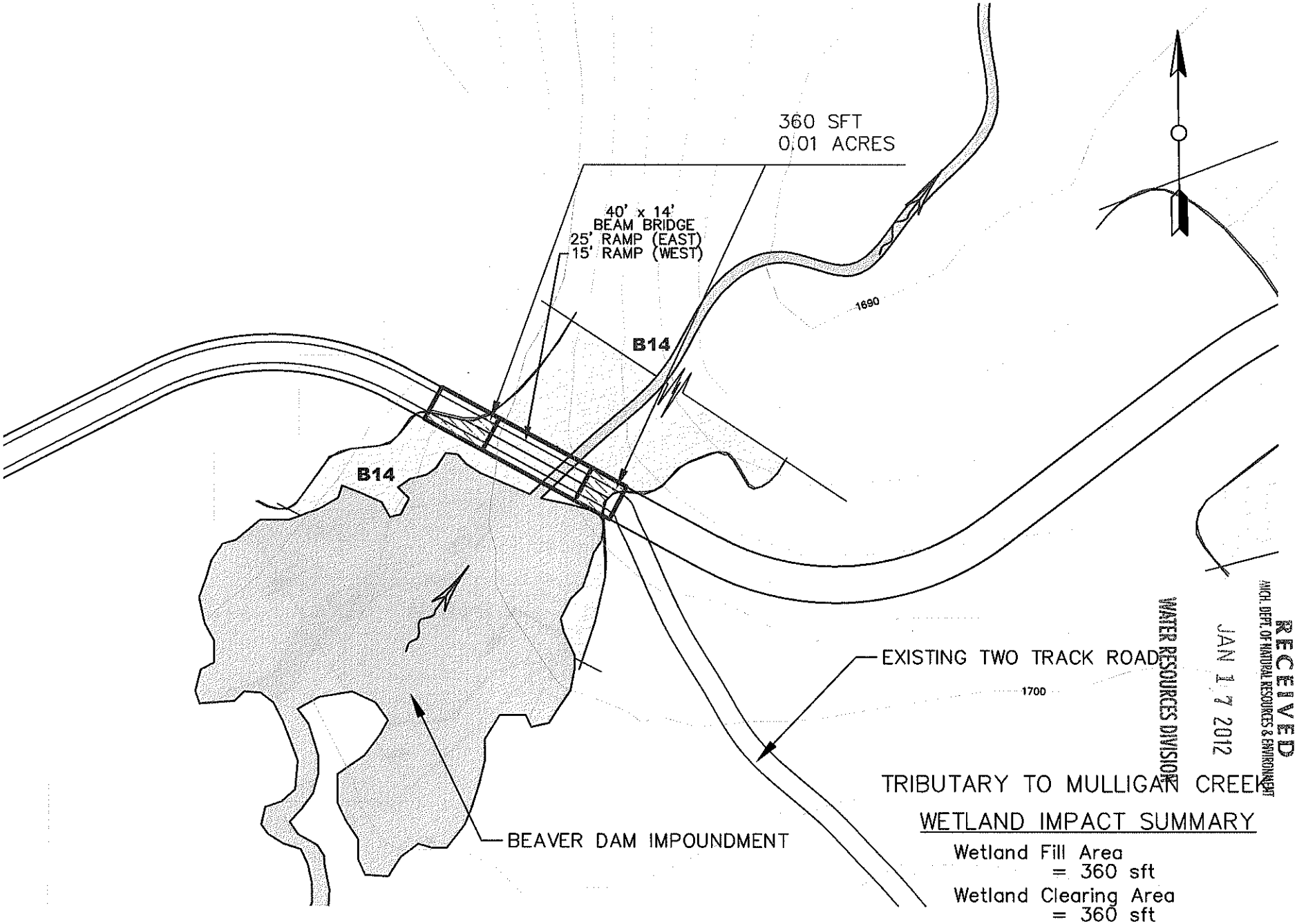
East Branch Salmon Trout River Stream Mitigation

Y1	Falls		14		
Y1	Falls		19		
Y1	Falls		71		
Y1	Falls		245		
Y1	Falls		61		
Y1	Falls		52	0.01	

EB Salmon Trout TOTAL = 462 0.01

CR 595 TOTAL = 1,108,740 25.45
(Includes Non-regulated Wetlands)

GRAND TOTAL = 1,124,286 25.81



RECEIVED
MICH. DEPT. OF NATURAL RESOURCES & ENVIRONMENT
JAN 17 2012
WATER RESOURCES DIVISION

TRIBUTARY TO MULLIGAN CREEK

WETLAND IMPACT SUMMARY

Wetland Fill Area
= 360 sft

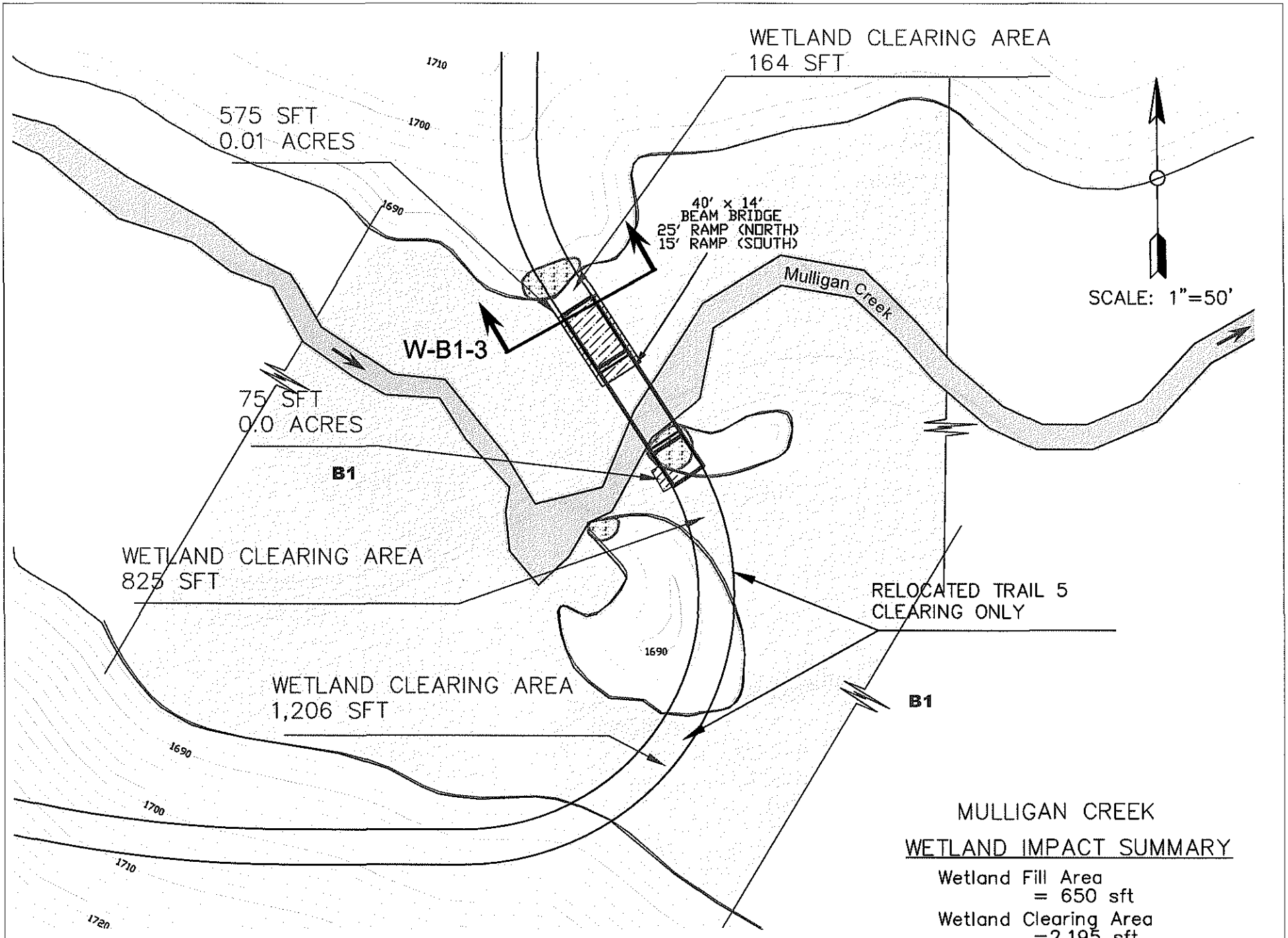
Wetland Clearing Area
= 360 sft

COLEMAN ENGINEERING COMPANY
635 CIRCLE DRIVE – IRON MOUNTAIN, MICHIGAN 49801 (906) 774-3440
200 EAST AYER STREET – IRONWOOD, MICHIGAN 49938 (906) 932-5048

SNOWMOBILE TRAIL 5 RELOCATION WETLAND IMPACT
TRIBUTARY TO MULLIGAN CREEK

CADD DRAWING
MULLIGAN CREEK
TRIBUTARY CROSSING

DATE:
12/19/11



MULLIGAN CREEK

WETLAND IMPACT SUMMARY

Wetland Fill Area
= 650 sft

Wetland Clearing Area
=2,195 sft

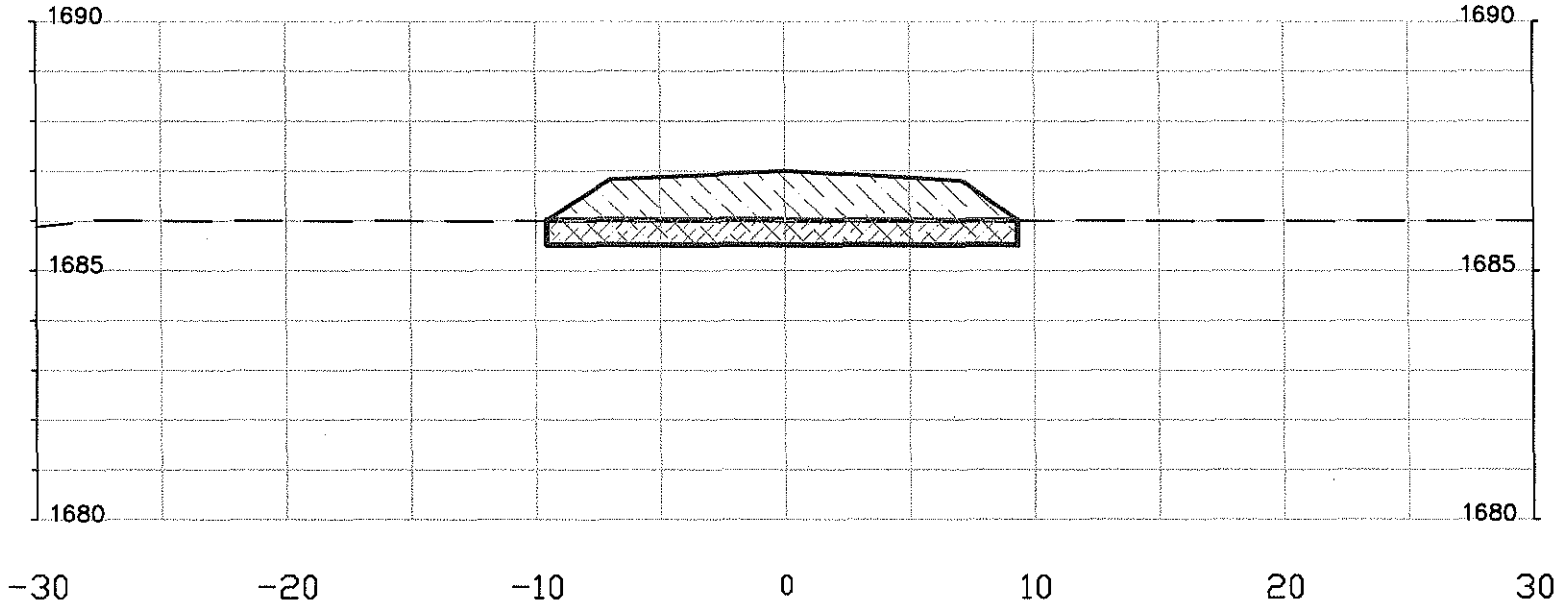
COLEMAN ENGINEERING COMPANY
635 CIRCLE DRIVE – IRON MOUNTAIN, MICHIGAN 49801 (906) 774-3440
200 EAST AYER STREET – IRONWOOD, MICHIGAN 49938 (906) 932-5048

SNOWMOBILE TRAIL 5 RELOCATION WETLAND IMPACT
MULLIGAN CREEK

CADD DRAWING
MULLIGAN CREEK
CROSSING

DATE:
12/19/11

W-B1-3



Total Wetland Exc. 57.4 CYD

Total Wetland Fill 172.2 CYD

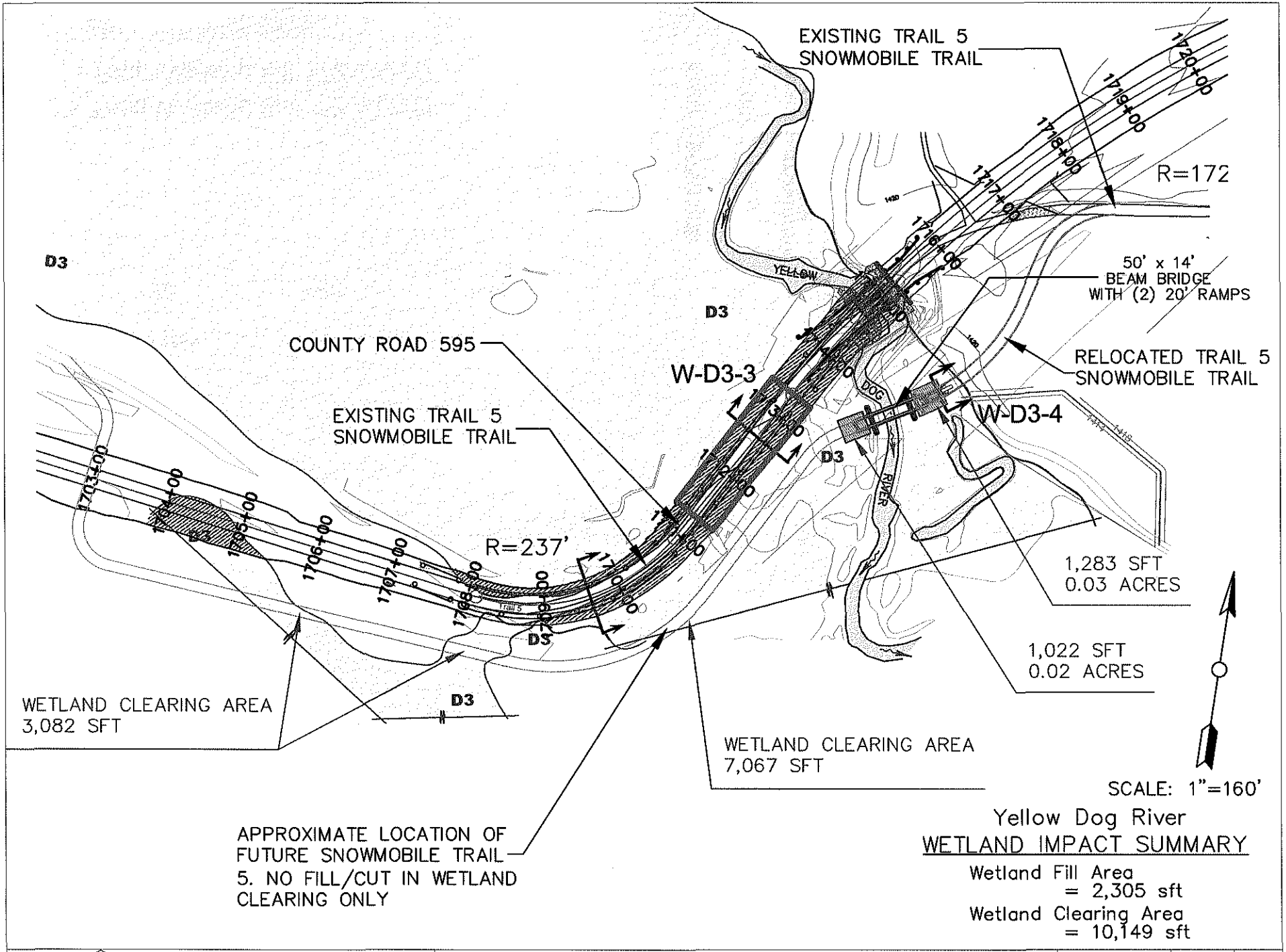
Fill Area	650 Sft
Wetland W-B1	0.01 Acres

COLEMAN ENGINEERING COMPANY
635 CIRCLE DRIVE – IRON MOUNTAIN, MICHIGAN 49801 (906) 774-3440
200 EAST AYER STREET – IRONWOOD, MICHIGAN 49938 (906) 932-5048

SNOWMOBILE TRAIL 5 RELOCATION WETLAND IMPACTS
MULLIGAN CREEK

CADD DRAWING: MULLIGAN CREEK CROSSING

DATE: 12/19/11



Yellow Dog River

WETLAND IMPACT SUMMARY

Wetland Fill Area
= 2,305 sft

Wetland Clearing Area
= 10,149 sft

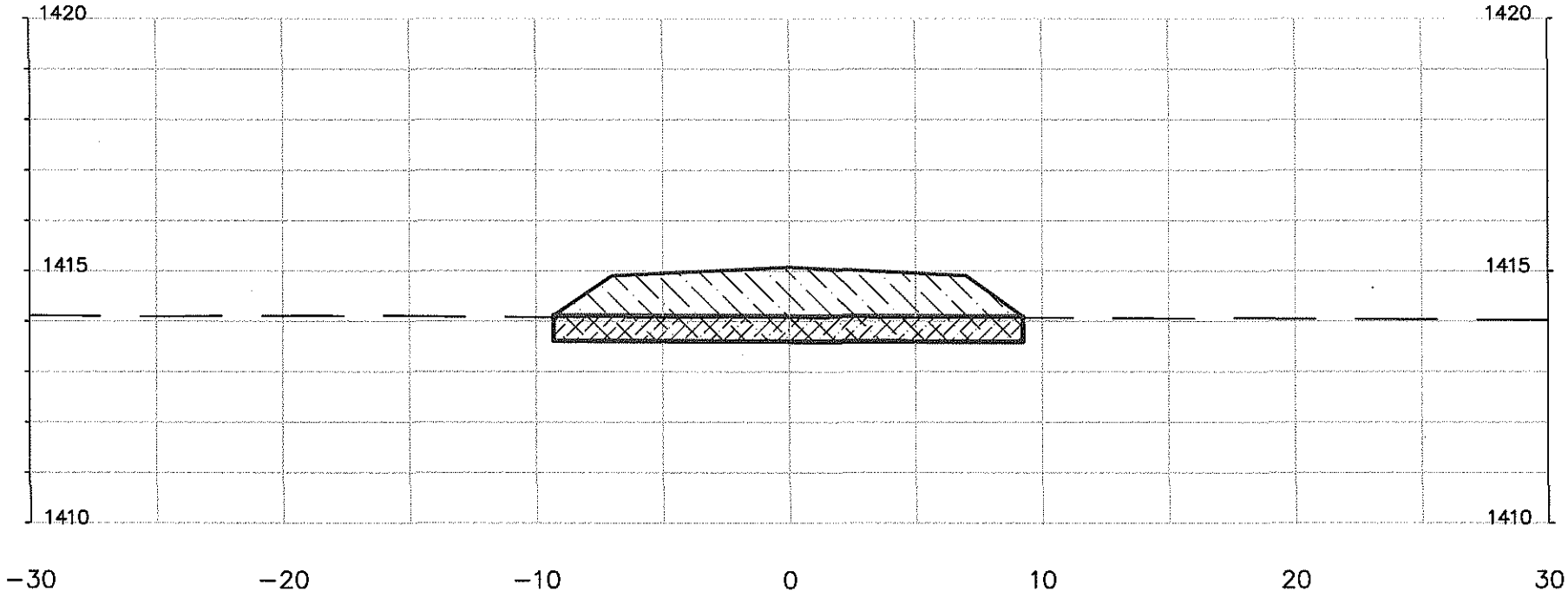
COLEMAN ENGINEERING COMPANY
635 CIRCLE DRIVE – IRON MOUNTAIN, MICHIGAN 49801 (906) 774-3440
200 EAST AYER STREET – IRONWOOD, MICHIGAN 49938 (906) 932-5048

SNOWMOBILE TRAIL 5 RELOCATION WETLAND IMPACT
YELLOW DOG RIVER

CADD DRAWING
YELLOW DOG
CROSSING

DATE:
12/19/11

W-D3-4



Total Wetland Exc. 37.0 CYD

Total Wetland Fill 111.1 CYD

Fill Area	2,305 Sft
Wetland W-D3	0.05 Acres

COLEMAN ENGINEERING COMPANY
635 CIRCLE DRIVE – IRON MOUNTAIN, MICHIGAN 49801 (906) 774-3440
200 EAST AYER STREET – IRONWOOD, MICHIGAN 49938 (906) 932-5048

SNOWMOBILE TRAIL 5 RELOCATION WETLAND IMPACT
YELLOW DOG RIVER

CADD DRAWING: YELLOW DOG CROSSING

DATE: 12/19/11

8.0 WETLAND MITIGATION

Avoidance and minimization of wetland impacts has been a primary focus during the planning and design of the proposed CR 595 in order to provide a road alignment that will meet regulatory criteria for permit issuance. Design criteria modifications in the location of the road and the road design have been made for the sole purpose of avoiding or minimizing impacts to wetlands to the greatest extent possible. Higher quality wetlands (e.g. bogs and undisturbed riparian wetlands) have been avoided to the extent possible. Wetland impacts have been minimized to the extent possible by decreasing road fill depths (i.e. lowering road grade); increasing the side slopes of the road embankment fill in wetlands to reduce the base width of the road embankment (which requires installation of guardrail in these sections) and adjusting the horizontal alignment of the road in efforts to minimize wetland encroachment.

The primary method of wetland mitigation for the CR 595 project will be the creation of a minimum of 48.41 acres of new wetlands to offset the unavoidable impacts to wetlands that would result from the project. In order to provide some additional wetland mitigation as a contingency, 49.4 acres of wetland are proposed to be created.

Wetland impacts by watershed and wetland type are provided in Table 8-1. Although wetland restoration will be accomplished in several small areas (but cumulatively significant), as explained in the following paragraph, there will be no credit sought for this restoration activity. There is no wetland preservation proposed by the MCRC for the CR 595 project.

Impacted emergent wetland types will be replaced at a ratio of 1.5 to 1 (1.5 acres of emergent wetland created for each acre of emergent wetland impacted). Scrub-shrub wetlands are also to be replaced at a ratio of 1.5 to 1. Forested wetland areas will be replaced at a ratio of 2 to 1. These wetland replacement ratios are specified by Part 303 and the Administrative Rules.

Table 8-1. Wetland Impacts by Watershed and Wetland Type.

Watershed	Wetland Type/Impacts (acres)			Total Impact (acres)
	Emergent	Scrub-Shrub	Forested	
Escanaba River	2.19	0.40	5.28	7.86
Michigamme River	0	0	0.62	0.62
Dead River**	2.45	0.20	11.39	14.04
Yellow Dog River**	1.19	0	2.09	3.28
Falls*	0	0	0.01	0.01
Totals	**5.83**	**0.60**	**19.38**	**25.81**

*East Branch Salmon Trout River restoration
**Includes Snowmobile Trail 5 relocation

8.01 Wetland Restoration

Some wetlands along the CR 595 route that have been filled in the past, primarily for trail/road construction, will be restored to their original grade and planted with a native wetland seed mix. These are mostly areas on the existing road system that will be cut off by the proposed road alignment; therefore they will no longer be needed for landowner access. On the proposed CR 595 project there are 29 separate areas that total approximately 3.53 acres of wetland to be restored. As mentioned above, MCRC is not proposing any credits for wetland mitigation from these wetland restoration areas. Table 8-2 lists the areas where

historic wetland fill will be removed to restore these wetlands and restore hydrologic flow in the wetlands.

Table 8-2. Wetlands to be Restored as a Result of Construction of the Proposed CR 595.

Wetland Designation	Watershed	Wetland Type	Restoration Area Sq Ft	Restoration Area Acres	Sheet #
C3	Escanaba	FO/SS	23,390	0.54	6
A61	Escanaba	FO/SS	2,631	0.06	8
A60	Escanaba	FO/EM	18,693	0.43	8
A60	Escanaba	FO/EM	2,540	0.06	8
A58	Escanaba	FO/SS	30,270	0.69	9
A56	Escanaba	EM	3,622	0.08	10
A54	Escanaba	FO/SS	14,841	0.34	10
E23	Dead	FO/SS	1,076	0.02	18
E23	Michigamme	FO/SS	4,536	0.10	19
E17	Dead	FO/EM	1370	0.03	21
E13	Dead	FO	1,488	0.03	22
E9	Dead	FO/EM	2,266	0.05	23
E2	Dead	FO/SS	3,330	0.08	24
E2	Dead	FO/SS	1,985	0.05	24
E1	Dead	FO	3,733	0.09	24
A15	Dead	FO/SS	1,073	0.02	28
A16	Dead	FO/SS	1,538	0.04	28
A17	Dead	FO/SS	479	0.01	28
B40	Dead	EM/SS	5,857	0.13	29
B37	Dead	FO/EM	3,379	0.08	30
B12	Dead	EM	269	0.01	31
B3	Dead	FO/SS	1,359	0.03	32
B1	Dead	EM/SS	1,824	0.04	33
L6	Yellow Dog	FO	3,688	0.08	35
L2	Yellow Dog	FO/EM	6,211	0.14	36
L2	Yellow Dog	FO/EM	12,519	0.29	36
TOTALS			**153,967**	**3.53**	

8.02 Wetland Creation

The proposed CR 595 will unavoidably impact 25.81 acres of wetland, including 0.44 acre of isolated, non-contiguous wetlands, which are not regulated by Part 303 but have been included in the impact totals simply to avoid questions over the regulatory status of these wetlands. Also included in the 25.81 acres of impact is 0.35 acre of wetland impact for the Trail 5 snowmobile trail relocation and 0.01 acre of wetland impact for the East Branch Salmon Trout River stream mitigation project. The impacted wetlands likely provide ecosystem functions such as flood control by the hydrologic absorption of and storage capacity of the wetland, and wildlife habitat by providing breeding, nesting and feeding grounds and cover for many forms of wildlife.

Creation of a total of 49.4 acres of new wetland is proposed, which is one acre more than the minimum required acreage (48.41 acres) for wetland mitigation. Figure 8-1 shows the

locations of the five wetland mitigation sites; Table 8-3 provides a breakdown of the proposed created wetlands by watershed and wetland type totaling 49.4 acres.

Five wetland mitigation sites are located in three of the four watersheds involved in the proposed CR 595 project. Due to the landscape characteristics and resultant lack of suitable wetland mitigation sites in the Dead River watershed, a portion of the wetland mitigation for the Dead River watershed is proposed at the Yellow Dog River watershed wetland mitigation site, and another portion is proposed at the Escanaba River watershed site. Also, due to the amount of wetland impact in the Michigamme River watershed (0.62 acre), the wetland mitigation for those impacts is proposed in the Escanaba River watershed, relatively close to the wetland impact. It is anticipated that these wetland mitigation sites will replace the value and functions lost with the impacts to existing wetlands, by providing similar ecosystem types in similar positions in the regional landscape.

The wetland mitigation sites have been studied by A. Lindberg & Sons, Inc., CEC and KME to determine the sites' suitability for creating wetlands. Piezometers were installed in 2008 and 2010 to monitor groundwater tables at the locations of potential wetland mitigation sites. Soil borings have been advanced to determine soil characteristics. Surveys were conducted to obtain topographic data for site design and excavation volumes. As a result, the confidence level in the probability of success of the five wetland mitigation sites is high.

The proposed wetland mitigation design plans require that topsoil is salvaged from the project and used for final grade establishment in the created wetlands to decrease the chance of having non-native plant species introduced into the landscape. Any mulch used on the project must be certified weed-free mulch for the same purpose. All proposed wetlands will be seeded and planted with a native wetland flora seed mix.

8.02.A. Yellow Dog River Watershed

The Yellow Dog River mitigation site (Figure 8-2) is located in upland between two existing forested wetlands. Current vegetation is coniferous forest. Soils within the proposed wetland footprint are Paquin sand, 0-6% slopes and Paquin-Finch sands, 0-5% slopes. The topography of the site slopes gradually from southwest to northeast, with a significant drop-off at the northeast extent towards an existing wetland. Four piezometers were installed in 2008 with an additional 8 installed in 2010. Monitoring of these piezometers suggests that the excavation of 8 to 10 feet of soils will bring the finish grade into appropriate proximity with the groundwater table to support wetland. A total of 8.1 acres of wetland creation are proposed in this watershed, consisting of 3.2 acres of emergent wetland, 0.7 acre of scrub/shrub wetland and 4.2 acres of forested wetland. Of the 8.1-acre total, 2.4 acres of wetland mitigation is proposed to replace wetlands unavoidably impacted in the Dead River watershed.

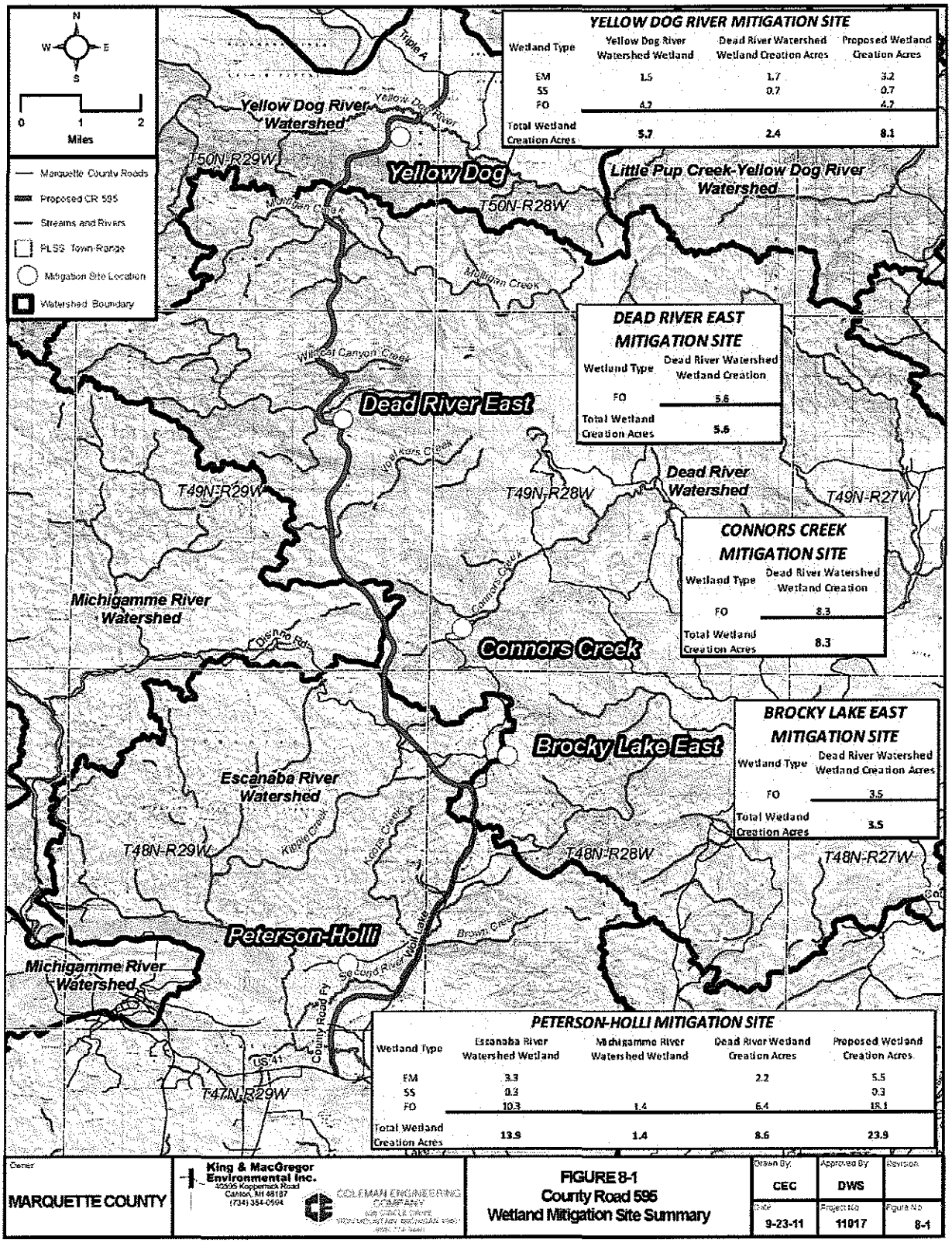

N
W
E
S
0
1
2
Miles
Marquette County Roads
Proposed CR 595
Streams and Rivers
PLSS Town-Range
Mitigation Site Location
Watershed Boundary
YELLOW DOG RIVER MITIGATION SITE
Wetland Type | Yellow Dog River Watershed Wetland | Dead River Watershed Wetland Creation Acres | Proposed Wetland Creation Acres
EM | 1.5 | 1.7 | 3.2
SS | | 0.7 | 0.7
FO | 4.2 | | 4.2
Total Wetland Creation Acres | 5.7 | 2.4 | 8.1
DEAD RIVER EAST MITIGATION SITE
Wetland Type | Dead River Watershed Wetland Creation
FO | 5.6
Total Wetland Creation Acres | 5.6
CONNORS CREEK MITIGATION SITE
Wetland Type | Dead River Watershed Wetland Creation
FO | 8.3
Total Wetland Creation Acres | 8.3
BROCKY LAKE EAST MITIGATION SITE
Wetland Type | Dead River Watershed Wetland Creation Acres
FO | 3.5
Total Wetland Creation Acres | 3.5
PETERSON-HOLLI MITIGATION SITE
Wetland Type | Escanaba River Watershed Wetland | Michigamme River Watershed Wetland | Dead River Wetland Creation Acres | Proposed Wetland Creation Acres
EM | 3.3 | | 2.2 | 5.5
SS | 0.3 | | | 0.3
FO | 10.3 | 1.4 | 6.4 | 18.1
Total Wetland Creation Acres | 13.9 | 1.4 | 8.6 | 23.9
Yellow Dog River Watershed
Yellow Dog
Little Pup Creek-Yellow Dog River Watershed
T50N-R29W
T50N-R28W
Dead River East
Dead River Watershed
T49N-R29W
T49N-R28W
T49N-R27W
Michigamme River Watershed
Connors Creek
Brocky Lake East
Escanaba River Watershed
T48N-R29W
T48N-R28W
T48N-R27W
Peterson-Holli
Michigamme River Watershed
T47N-R29W
Triple A
Mahlgren Creek
Mahlgren Creek
Wildcat Canyon Creek
Trout Lake Creek
Connors Creek
Dishno Rd
Kippola Creek
Koski Creek
Brown Creek
Second River
Trout Lake
County Road FY
US 41
Owner
MARQUETTE COUNTY
King & MacGregor Environmental Inc.
45995 Koppernick Road
Canton, MI 48187
(734) 354-0594
COLEMAN ENGINEERING COMPANY
FIGURE 8-1
County Road 595
Wetland Mitigation Site Summary
Drawn By: CEC
Approved By: DWS
Revision:
Date: 9-23-11
Project No: 11017
Figure No: 8-1

Table 8-3. Proposed Created Wetlands for each Watershed and Wetland Type*

Mitigation Site	Watershed	Emergent (acres)	Scrub-Shrub (acres)	Forested (acres)	Total Wetland Created (acres)
Yellow Dog	Yellow Dog River (aka Falls)	1.5		1.2	5.7
Yellow Dog	For Dead River Watershed Impacts	1.7	0.7	0	2.4
Yellow Dog Site Total		3.2	0.7	4.2	**8.1**
Dead River East	Dead River	0	0	5.6	5.6
Brocky Lake East	Dead River	0	0	3.5	3.5
Connors Creek	Dead River	0	0	8.3	8.3
Dead River Sites Total		0	0	17.4	**17.4**
Peterson-Holli	Escanaba River Watershed	3.3	0.3	12.1	15.7
Peterson-Holli	For Dead River Watershed Impacts	2.2		4.75	6.95
Peterson-Holli	For Michigamme River Watershed Impacts	0	0	1.25	1.25
Escanaba River Site Total		5.5	0.3	18.1	**23.9**
Totals		**8.7**	**1.0**	**39.7**	**49.4**

*Includes mitigation for Trail 5 relocation and East Branch Salmon Trout River mitigation project.

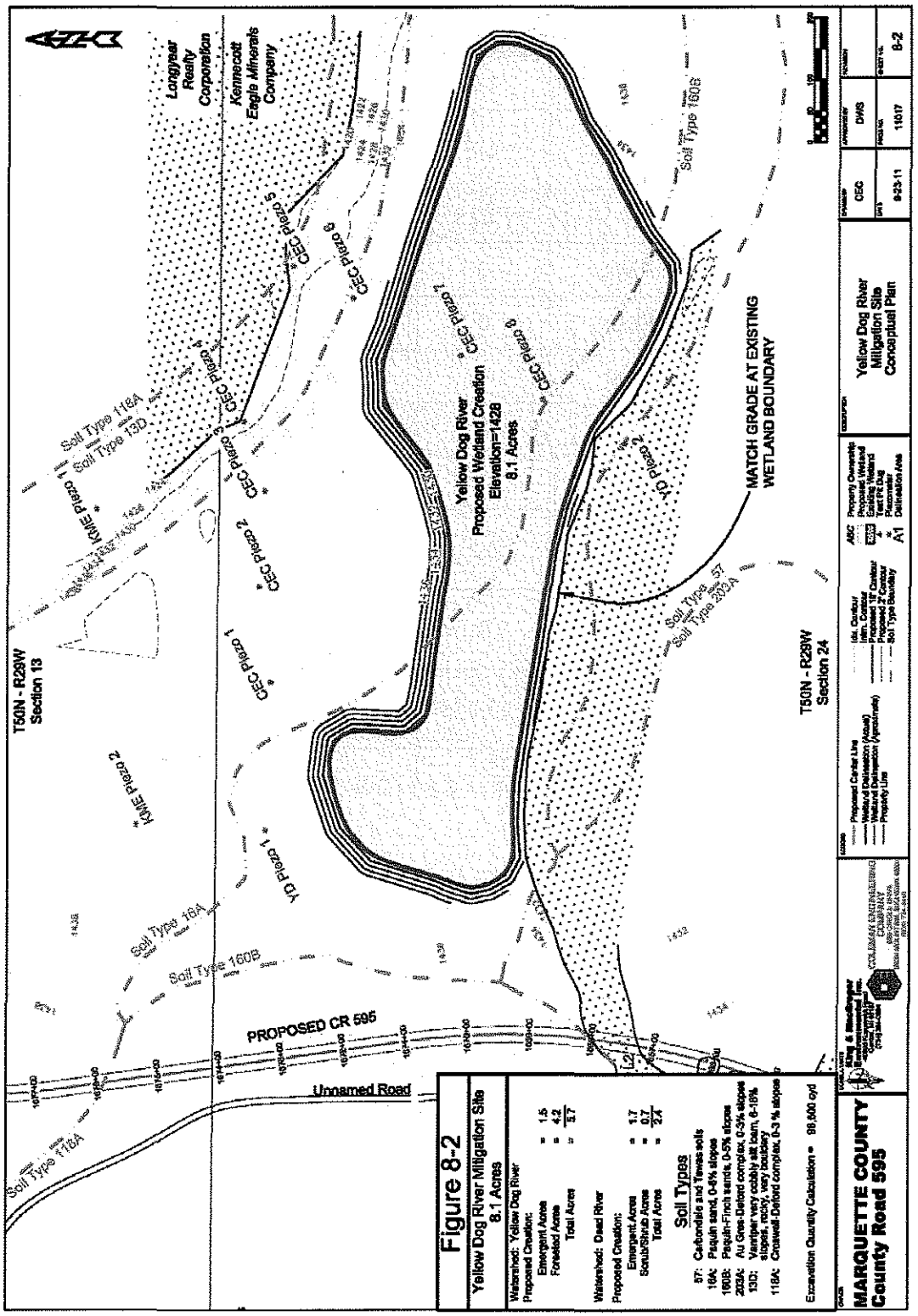


Figure 8-2
Yellow Dog River Mitigation Site
8.1 Acres
Watershed: Yellow Dog River
Proposed Creation:
Emergent Acres = 1.5
Forested Acres = 4.2
Total Acres = 5.7
Watershed: Dead River
Proposed Creation:
Emergent Acres = 1.7
Scrub/Shrub Acres = 0.7
Total Acres = 2.4
Soil Types
97: Carbondale and Tawas soils
16A: Pequin sand, 0-6% slopes
160B: Pequin-Finch sands, 0-5% slopes
203A: Au Gres-Deford complex, 0-3% slopes
130: Vamper very cobbly silt loam, 6-18% slopes, rocky, very bouldery
116A: Croswell-Deford complex, 0-3 % slopes
Excavation Quantity Calculation = 98,000 cyd
MARQUETTE COUNTY
County Road 595
Yellow Dog River
Mitigation Site
Conceptual Plan
DES
DWS
8-23-11
11017
8-2
Yellow Dog River
Proposed Wetland
Elevation=1428
8.1 Acres
MATCH GRADE AT EXISTING
WETLAND BOUNDARY
T50N - R29W
Section 13
T50N - R28W
Section 24
PROPOSED CR 595
Unnamed Road
Soil Type 116A
Soil Type 15D
Soil Type 16A
Soil Type 160B
Soil Type 57
Soil Type 203A
Soil Type 130B
KMIE Plaza 1
KMIE Plaza 2
CEC Plaza 1
CEC Plaza 2
CEC Plaza 3
CEC Plaza 4
CEC Plaza 5
YD Plaza 1
YD Plaza 2
Longyear Realty Corporation
Kennecott Eagle Minerals Company

8.02.B. Dead River Watershed

The Dead River East mitigation site (Figure 8-3) is located in upland immediately southwest of an existing forested wetland. Current vegetation is deciduous forest. Soils within the proposed wetland footprint are Keewaydin-Dishno complex, 6-18% slopes, including rock and boulder. The topography of the site slopes significantly from southwest to northeast. Six piezometers were installed in 2008. Monitoring of these piezometers suggests that the excavation of between 2 and 32 feet of soils will bring the finish grade into appropriate proximity with the groundwater table to support wetland. A total of 5.6 acres of forested wetland mitigation is proposed at the Dead River East location.

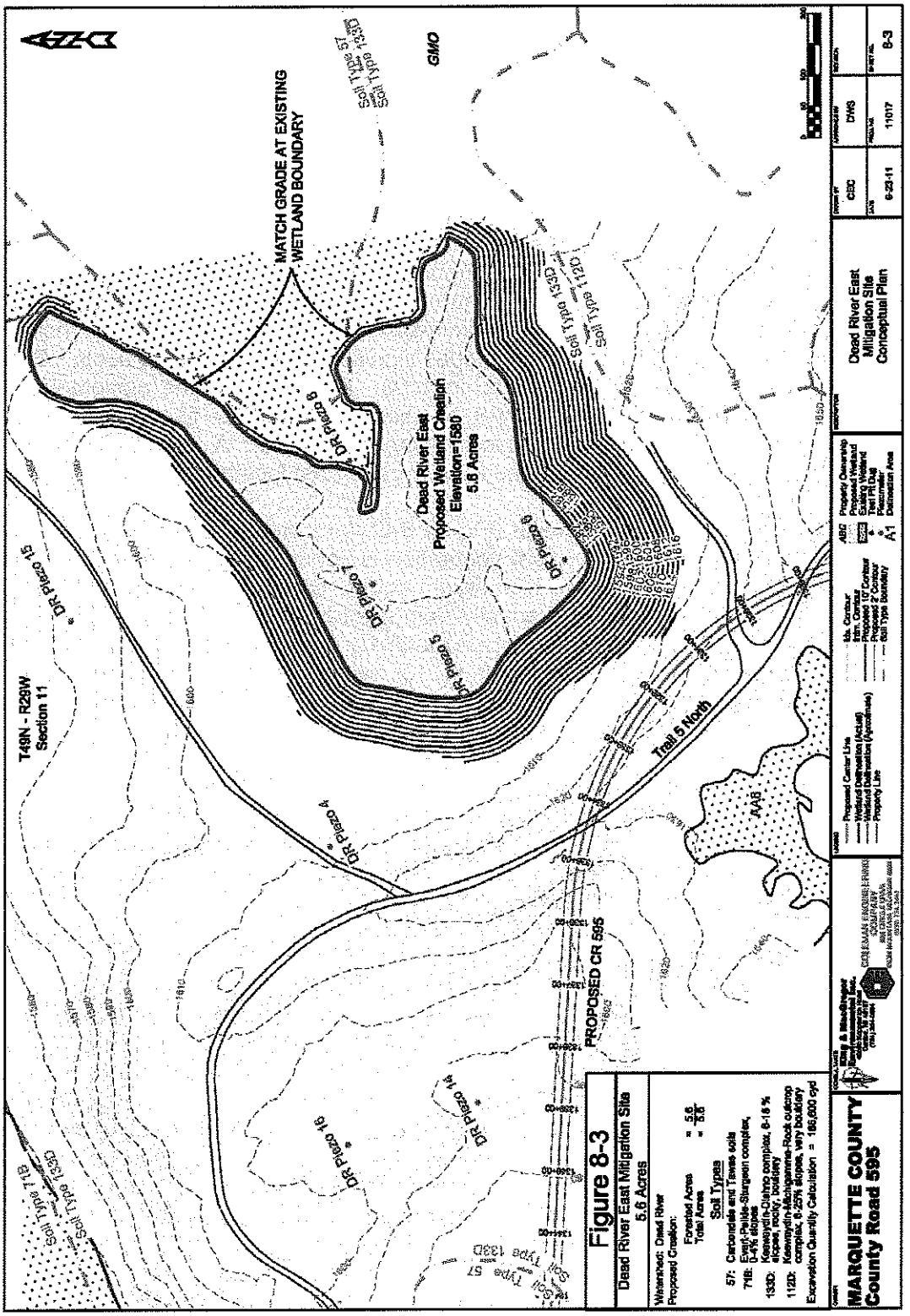
The Brocky Lake East mitigation site (Figure 8-4) is located in upland immediately north of an existing forested wetland. Current vegetation is young red pine plantation. Soils within the proposed wetland footprint are Keewaydin-Dishno complex, 1-6% slopes, including rock and boulder. The topography of the site slopes significantly from north to south. One piezometer was installed in the adjacent wetland in 2008. Monitoring of the piezometer suggests the excavation of between 2 and 8 feet of soils will bring the finish grade into appropriate proximity with the groundwater table to support wetland. A total of 3.5 acres of forested wetland mitigation is proposed at the Brocky Lake East location.

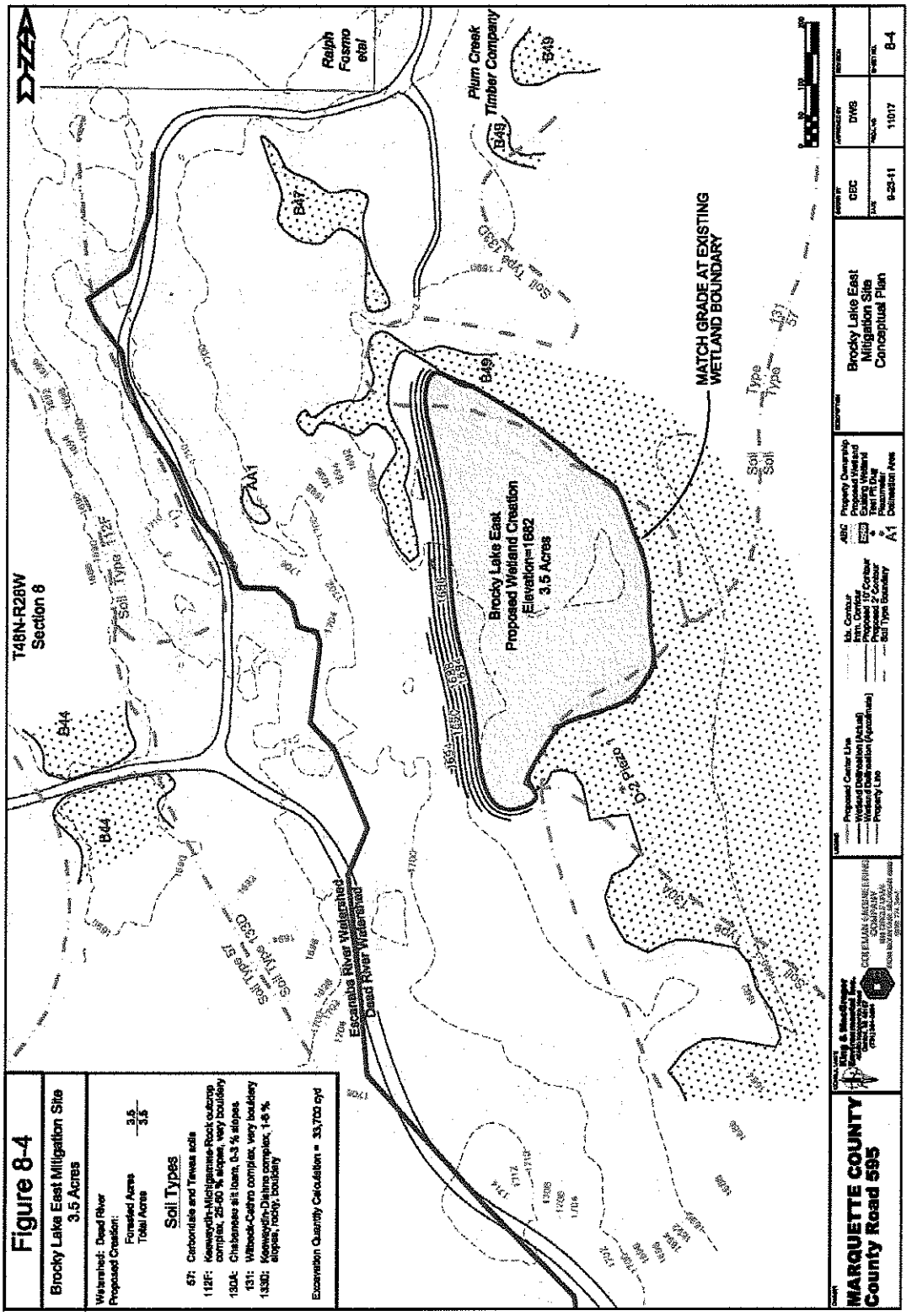
The Connors Creek mitigation site (Figure 8-5) is located in upland immediately west of an existing forested wetland. Current vegetation is young red pine plantation. Soils within the proposed wetland footprint are Keewaydin cobbly fine sandy loam with 1-6% slopes. The topography of the site slopes gradually from west to east. One piezometer was installed in 2008 and four piezometers were installed in 2010. Monitoring of these piezometers suggests that the excavation of between 5 and 13 feet of soils will bring the finish grade into appropriate proximity with the groundwater table to support wetland. A total of 8.3 acres of forested wetland mitigation is proposed at the Conners Creek location.

A total of 26.75 acres of wetland mitigation is required for the wetland impacts in the Dead River watershed. Of that total, 17.4 acres of wetland will be created within the Dead River watershed. Due to the lack of suitable sites within the Dead River watershed, 2.4 acres of wetland will be created in the Yellow Dog River watershed and 6.95 acres in the Escanaba River watershed wetland mitigation sites.

8.02.C.Escanaba River Watershed

The Peterson-Holli mitigation site (Figure 8-6) is located in upland and is adjacent to several small, state-unregulated wetlands, immediately north of an existing scrub/shrub and emergent wetland. Current vegetation is young red pine plantation. Soils within the proposed wetland footprint are Pence fine sandy loam on 0-6% slopes and Farquar gravelly sandy loam with 0-4% slopes. The topography of the site slopes gradually from north to south. Two piezometers were installed in 2008. Monitoring of these piezometers suggests that the excavation of between two feet and 10 feet of soils will bring the finish grade into appropriate proximity with the groundwater table to support wetland.


MATCH GRADE AT EXISTING WETLAND BOUNDARY
Dead River East Proposed Wetland Creation Elevation=1580 5.6 Acres
T49N - R29W Section 11
PROPOSED CR 595
Trail 5 North
GMO
Soil Type 71B
Soil Type 133D
Soil Type 112D
Soil Type 133D
Soil Type 133D
DR Piezo 1
DR Piezo 2
DR Piezo 3
DR Piezo 4
DR Piezo 5
DR Piezo 6
DR Piezo 7
DR Piezo 8
DR Piezo 9
DR Piezo 10
DR Piezo 11
DR Piezo 12
DR Piezo 13
DR Piezo 14
DR Piezo 15
DR Piezo 16
Figure 8-3
Dead River East Mitigation Site
5.6 Acres
Wetlands: Dead River
Proposed Creation:
Forested Acres = 5.6
Total Acres = 5.6
Soil Types
57: Carbondale and Tawas soils
71B: Ewen-Pelkie-Sturgeon complex, 0-4% slopes
133D: Kenaystin-Dishno complex, 6-18 % slopes, rocky, bouldery
112D: Kenaystin-Michigamme-Rock outcrop complex, 6-25% slopes, very bouldery
Excavation Quantity Calculation = 186,000 cyd
Dead River East Mitigation Site Conceptual Plan
MARQUETTE COUNTY
County Road 595
CEC
DWG
6-23-11
11017
8-3



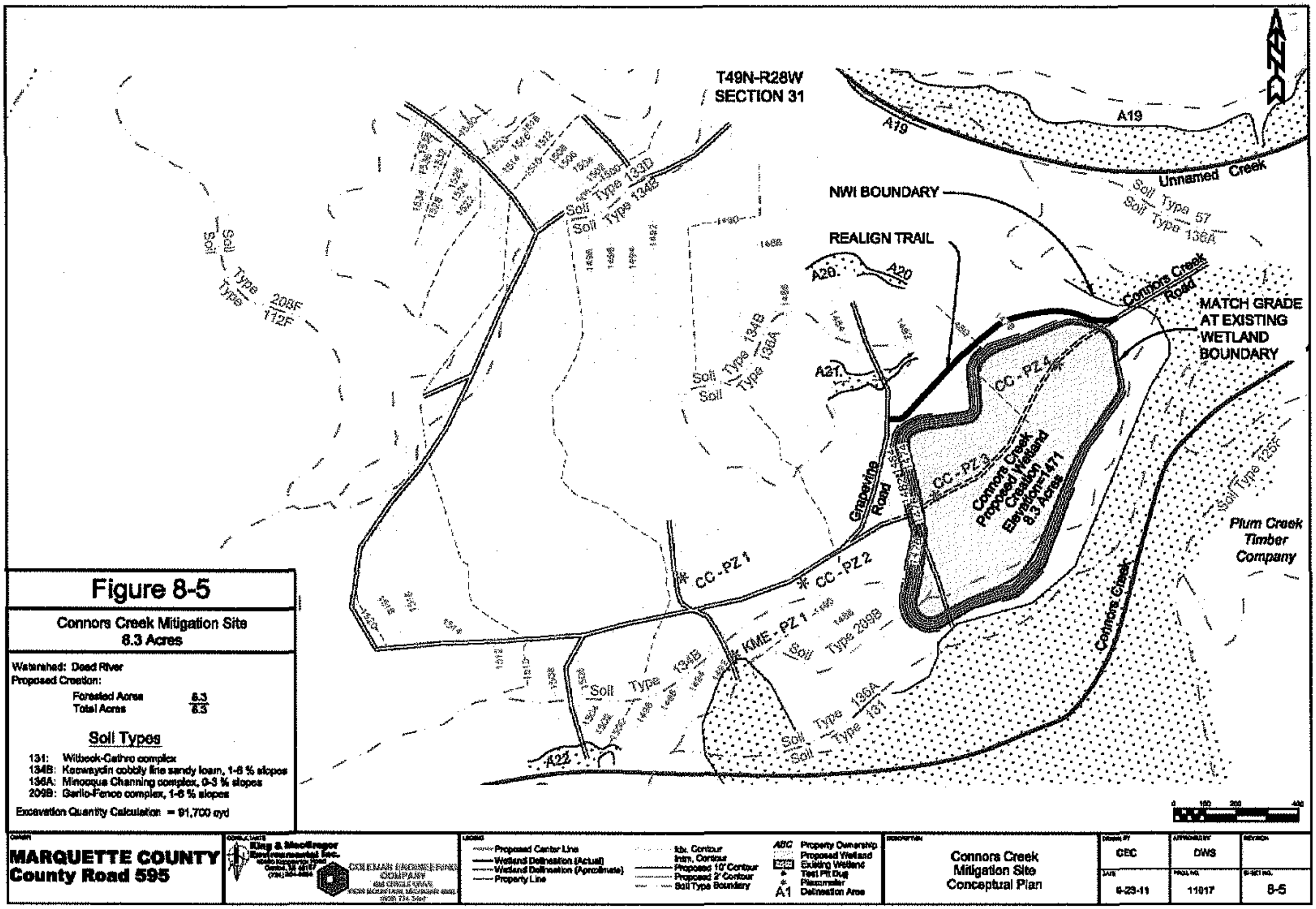


Figure 8-5

Connors Creek Mitigation Site
8.3 Acres

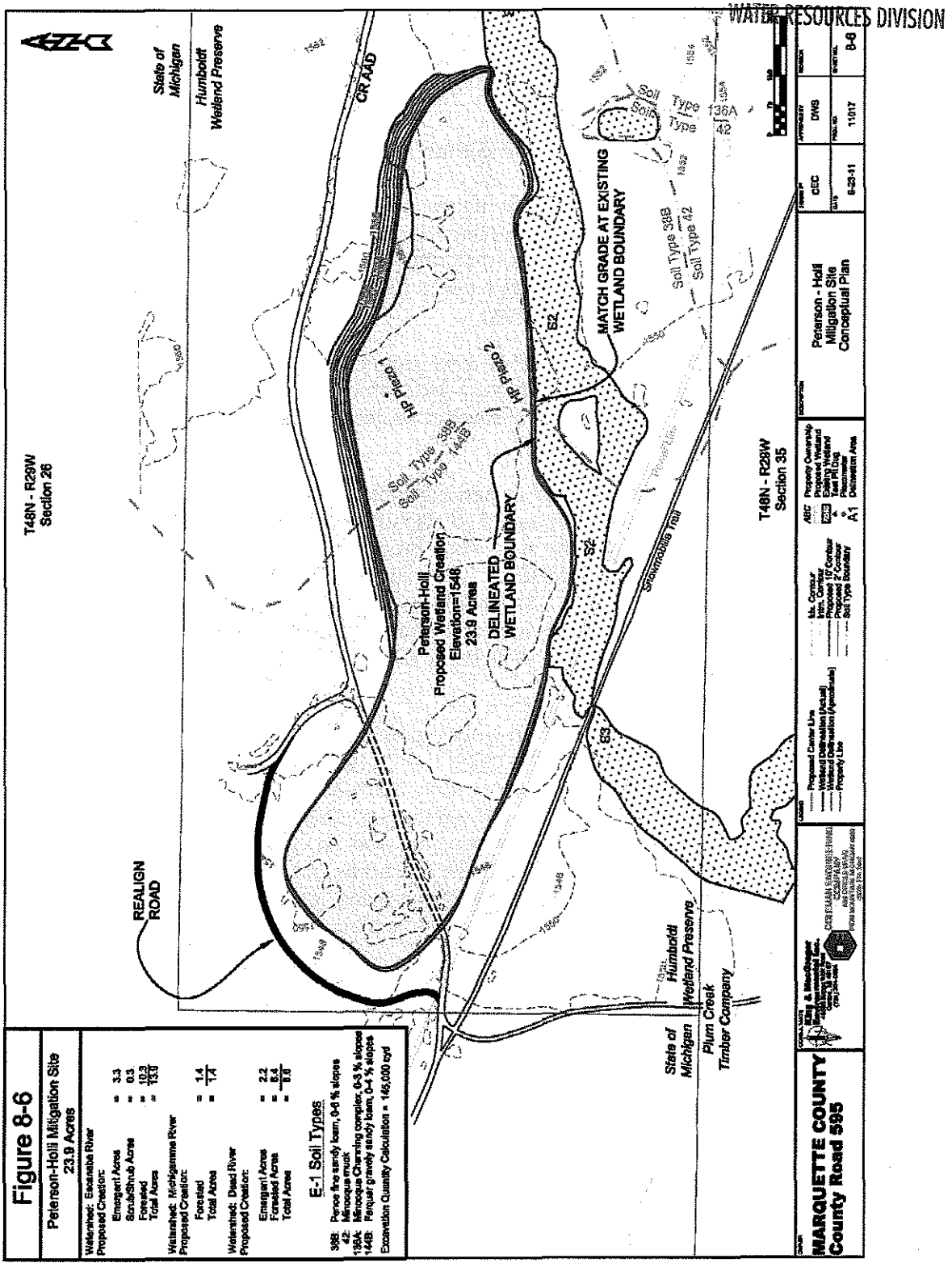
Watershed: Dead River
Proposed Creation:

Forested Acres	8.3
Total Acres	8.3

Soil Types

131: Witbeck-Gethro complex
134B: Keewaydin cobbly fine sandy loam, 1-6 % slopes
136A: Minocqua Channing complex, 0-3 % slopes
209B: Garlic-Fence complex, 1-6 % slopes

Excavation Quantity Calculation = 91,700 cyd



A total of 23.9 acres of wetland mitigation is proposed in the Escanaba River watershed, consisting of 5.5 acres of emergent wetland, 0.3 acre of scrub/shrub wetland and 18.1 acres of forested wetland. Of the 23.9 acres of mitigation in the Escanaba River watershed, 1.25 acres will be for wetland impacts in the Michigamme River watershed and 6.95 acres for impacts in the Dead River watershed.

8.03 Wetland Mitigation Monitoring Plan

A detailed wetland mitigation plan showing the location of vegetative sampling transects, sample plots, photograph points, monitoring wells, and staff gages will be provided to MDEQ following approval of the proposed mitigation site locations. MCRC will monitor the wetland mitigation sites for a minimum of five years following the year that construction is completed. The following protocols are proposed:

1. Measure surface water inundation and groundwater levels in each wetland mitigation site continuously during the growing season with remote data loggers. Hydrology parameters will be measured and data will be collected at sufficient sample points to accurately depict the water regime at each wetland type.

2. Vegetation will be evaluated in sample plots located along transects in each mitigation area between July 15 and August 31 in each monitoring year. The number of sample plots necessary within each wetland type shall be determined by use of a species-area curve or other approach approved by MDEQ. The minimum number of sample plots for each wetland type will be no fewer than five. Sample plots will be located on the sample transect at evenly spaced intervals or by another approach acceptable to MDEQ. If additional or alternative sample transects are needed to sufficiently evaluate each wetland type, they will be approved in advance in writing by MDEQ.

The herbaceous layer (i.e. all non-woody plants and woody plants less than 3.28 feet (one meter) in height) will be evaluated using a 3.28-foot by 3.28-foot (one square meter) sample plot. Shrub and tree species greater than 3.28 feet (one meter) in height will be sampled using a 30-foot radius sample plot. The data recorded for each herbaceous layer sample plot shall include a list of all living plant species, and an estimate of percent cover in 5 percent intervals for each species recorded, bare soil areas, and open water relative to the total area of the plot. The number and species of surviving, established, and free-to-grow trees and shrubs will be recorded for each 30-foot radius plot.

Plot data and a list of all the plant species identified in the plots and otherwise observed during monitoring will be provided. Data for each plant species must include common name, scientific name, wetland indicator category from the U.S. Fish and Wildlife Service's "National List of Plant Species That Occur in Wetlands" for Region 3, and whether the species is considered native according to the Michigan Floristic Quality Assessment (Michigan Department of Natural Resources, 2001). Nomenclature shall follow Voss (1972, 1985, and 1996) or Gleason and Cronquist (1991).

The location of sample transects and plots will be identified in the monitoring report on a plan view showing the location of wetland types. Sample transects will be permanently staked at a frequency sufficient to locate the transects in the field.

3. Any open water, bare soil, areas dominated by invasive non-native species, and areas without a predominance of wetland vegetation that are greater than 0.01 acre in size (436 square feet) will be delineated with GPS locations shown on the wetland mitigation plans.

4. Sightings or evidence of wading birds, songbirds, waterfowl, amphibians, reptiles, and other animal use (lodges, nests, tracks, scat, etc.) within the wetland noted during monitoring will be documented. The number, type, and date of the sightings will be provided.

5. Inspect the site during all monitoring visits for oil, grease, man-made debris, and all other contaminants and report any such findings.

6. Rate the water clarity in the mitigation wetland (e.g., poor, fair, good, excellent).

7. Provide annual photographic documentation of the development of the mitigation wetland during vegetation sampling from permanent photo stations located within the mitigation wetland. At a minimum, photograph stations shall be located at both ends of each transect. Photos must be labeled with the location, date photographed, and direction the photograph was taken.

8. Provide one-time photographic documentation during placement of at least six (6) inches of soil obtained from the A-horizon of an organic or loamy surface textured soil.

9. Provide the number and type of habitat structures placed and representative photographs of each structure type.

10. Provide a written summary of data from previous monitoring periods and include discussion of changes or trends based on all monitoring results including a calculation of the acres of each wetland type established.

11. Provide a written summary of any areas dominated by invasive, non-native species, and areas without a predominance of wetland vegetation that have been identified and provide potential corrective measures to bring such areas into compliance with the performance standards.

The monitoring report, which compiles and summarizes all data collected during the monitoring period, shall be submitted annually by MCRC. Monitoring reports shall cover the period of January 1 through December 31 and be submitted to MDEQ prior to January 31 of the following year.

Three printed and bound copies of the annual monitoring report and an electronic copy will be provided to MDEQ, Upper Peninsula District Office, Water Resources Division, and 420 Fifth Street, Gwinn, MI 49841.

8.04 Wetland Mitigation Site Performance Standards

If any of the mitigation wetlands do not meet the following performance standards by the end of the monitoring period, or are not satisfactorily progressing during the monitoring period, MCRC may be required by MDEQ to take corrective actions.

1. Construction has been completed in accordance with MDEQ-approved plans and specifications referenced in the permit.

2. By the end of the monitoring period the mitigation wetland will be characterized by the presence of water at a frequency and duration sufficient to support a predominance of wetland vegetation and the wetland types specified in the mitigation plans have been established.

3. A layer of high-quality soil from the A-horizon of an organic or loamy surface texture soil shall be placed over the entire created wetland area at a minimum thickness of 6 inches.

4. The mitigation wetland shall be free of oil, grease, debris, and all other contaminants.

5. A minimum of six wildlife habitat structures consisting of at least three types have been placed per acre of mitigation wetland. At least 50 percent of each structure shall extend above the normal water level. The types of acceptable wildlife habitat structures are as follows:

a. Tree stumps placed horizontally within the wetland. Stumps shall be a minimum of six feet long (log and root ball combined) and 12 inches in diameter.

b. Logs placed horizontally within the wetland. Acceptable logs shall be a minimum of 10 feet long and six inches in diameter.

c. Whole trees placed horizontally within the wetland. Acceptable whole trees shall have all of their fine structure left intact (i.e., not trimmed down to major branches for installation) and be a minimum of 20 feet long (tree and root ball) and a minimum of 12 inches in diameter at breast height (DBH).

d. Snags, which include whole trees left standing that are dead or dying, or live trees that will be flooded and die, or whole trees installed upright in the wetland. A variety of tree species should be used for the creation of snag habitat. Acceptable snags shall be a minimum of 20 feet tall (above the ground surface) and a minimum of 12 inches DBH. Snags should be grouped together so as to provide mutual functional support as nesting, feeding, and perching sites.

e. Sand mounds at least 18 inches in height and placed so that the sand mounds are surrounded by a minimum of 30 feet of water measuring at least 18 inches in depth. The sand mound shall have at least a 200 square foot area that is 18 inches above the projected high water level and located to receive maximum amounts of sunlight.

6. Mean percent cover of native wetland species in the herbaceous layer at the end of the monitoring period shall be not less than 80 percent for forested, scrub-shrub, and emergent wetlands.

The total percent cover of wetland species in each plot shall be averaged for plots measured in the same wetland type to obtain a mean percent cover value for each wetland type. Plots within identified extensive (i.e. areas greater than 0.01 acre in size) open water and submergent vegetation areas, bare soil areas, and areas without a predominance of wetland vegetation shall not be included in this average. Wetland species refers to species listed as Facultative and wetter (FAC, FAC+, FACW-, FACW, FACW+, and OBL) on the U.S. Fish and Wildlife Service's "National List of Plant Species That Occur in Wetlands" for Region 3.

Extensive (i.e. areas greater than 0.01 acre in size) open water and submergent vegetation areas having no emergent and/or floating vegetation shall not cumulatively exceed 20 percent of any of the mitigation wetlands. Extensive areas of bare soil shall not cumulatively exceed five percent of any of the mitigation wetlands.

7. The mitigation wetland supports a predominance of wetland vegetation in each vegetative layer (i.e. forested, scrub-shrub, and emergent) represented by a minimum of 15 native wetland species at the end of the monitoring period. The total number of native wetland plant species shall be determined by a sum of all species identified in sample plots of the same wetland type.

8. At end of the monitoring period, the mitigation wetland supports a minimum of:

a. 300 individual surviving, established, and free to grow trees per acre in the forested wetland that are classified as native wetland species and consisting of at least three different species.

b. 300 individual surviving, established, and free to grow shrubs per acre in the scrub-shrub wetland that are classified as native wetland species and consisting of at least four different species.

c. A minimum of eight (8) native emergent wetland species of grasses, sedges, or rushes.

9. The mean percent cover of invasive species including, but not limited to, *Phragmites australis* (common reed), *Lythrum salicaria* (purple loosestrife), and *Phalaris arundinacea* (reed canary grass) shall in combination be limited to no more than 10 percent within each wetland type. Invasive species shall not dominate the vegetation in any extensive area of a mitigation wetland (i.e. any area greater than 0.01 acre in size).

If the mean percent cover of invasive species is more than 10 percent within any wetland type or if there are extensive areas of the mitigation wetland in which an invasive species is one of the dominant plant species, MCRC shall submit an evaluation of the problem to the MDEQ. If MCRC determines that it is not feasible to reduce the cover of invasive species to meet the above performance standard MCRC must submit an assessment of the problem, a control plan, and the projected percent cover that can be achieved for review by MDEQ. Based on this information, MDEQ may approve an alternative invasive species standard. Any alternative invasive species standard must be approved in writing by MDEQ.

8.05 Wetland Mitigation Alternative Concept

Approximately 25 percent of Marquette County is wetland according to the MDEQ Final Wetland Inventory. Extensive areas of bedrock outcrops are also present in the county. Much of the remaining uplands in parts of the county are valuable for timber production, some of which are world-class hardwoods. Creating additional wetlands for wetland mitigation by converting uplands, while meeting statutory criteria, may not be a wise resource decision. For this purpose, an alternative mitigation concept is presented in this application for permit for consideration by the MDEQ at the appropriate time during the application review process.

It has been widely recognized by MDEQ, environmental groups, and others that some road locations and existing crossings of streams in northwest Marquette County need to be reconstructed to minimize the impacts to streams. For that reason, the stream mitigation for the CR 595 project is proposed. The relocation of a portion of Triple A Road, the removal of three existing culverts in the East Branch Salmon Trout River and restoration of the stream in those locations, and the construction of one clear-span bridge over the East Branch Salmon Trout River would be a significant stream mitigation project and is described in detail in the Section 9.4 of this report However, additional, similar stream restoration projects on CR 510 would likely result in more environmental benefit in terms of the natural resources improvements than creating wetlands.

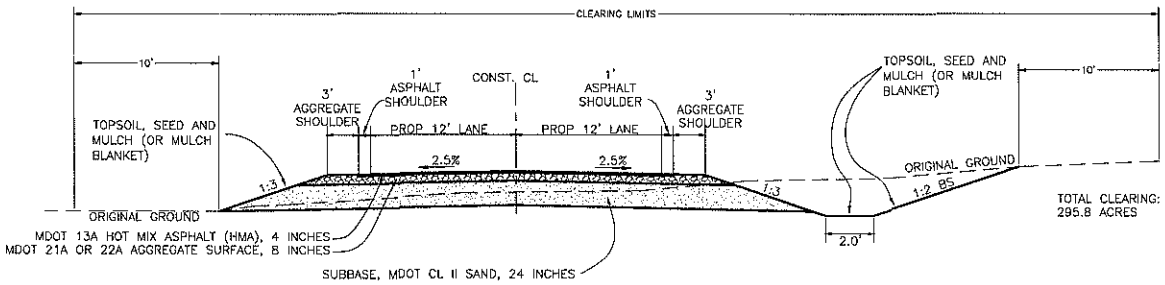
The impacts of the existing CR 510 on portions of the Big Garlic River, Lost Creek, Big Pup Creek, and other streams along CR 510 are evident. The stream in some areas flows directly adjacent to the road, sometimes on both sides of the road. The existing culverts appear to be inadequately sized, and some are perched and therefore may be blocking fish movements within the stream. Stream bank erosion and sedimentation entering the stream are existing, on-going issues due to the location of the streams adjacent to the existing road, or due to inadequate culvert sizes.

Stream relocation and stream restoration projects are expensive. Replacing culverts with larger structures such as Conspan® bridges or box culverts is costly, but provides long-term solutions to stream habitat degradation. Relocation of roads in this area is complicated due to the steep topography and the presence of wetlands; however it does appear to be possible with certain construction cost limitations.

MCRC proposes to coordinate with MDEQ in regard to the feasibility of an additional and alternative mitigation concept for this project. The goal is to satisfy Part 303 and its the Administrative Rules for wetland mitigation while at the same time accomplishing stream restoration projects in the area that would have more substantial benefit to wetlands, streams, and existing upland resources.

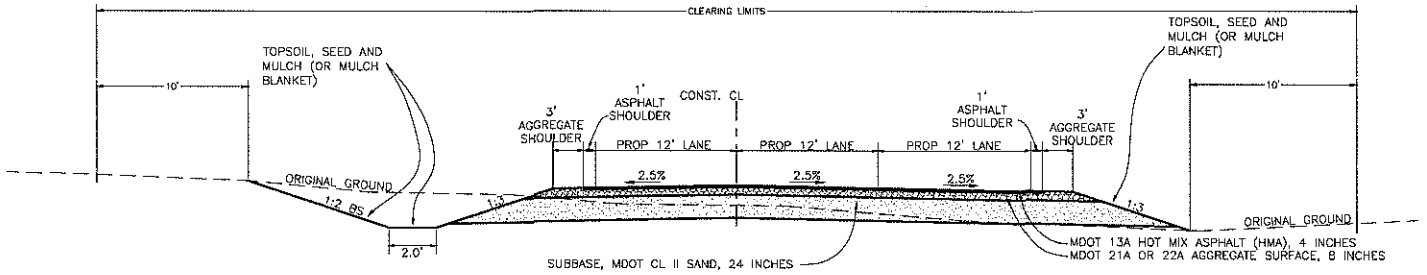
MCRC proposes to determine the approximate cost of the wetland mitigation as proposed in this application for permit in coordination with MDEQ, including land costs, construction costs, planting costs, and monitoring costs. Any reduction in costs associated with a reduced wetland creation requirement would then be used as the budget for the stream restoration project(s) in lieu of wetland creation, which could be prioritized by MDEQ. The budget would include engineering and environmental costs. MCRC would then proceed with preliminary design of the project(s) starting with the highest priority project. Preliminary plans and estimated costs could be reviewed by MDEQ and decisions made on plan revisions and authorization to proceed with an application for permit for the stream restoration. If permits can be issued by MDEQ, then final stream restoration construction plans can be completed and the project(s) bid for construction.

Such stream restoration project(s) would result in tangible benefits to the natural resources of Marquette County. Improvement of stream habitat and quality for fish and other aquatic organisms could be much more beneficial than creating mitigation wetlands in an already wetland-rich landscape. Otherwise, such stream improvement project(s) may not otherwise be accomplished for many years.



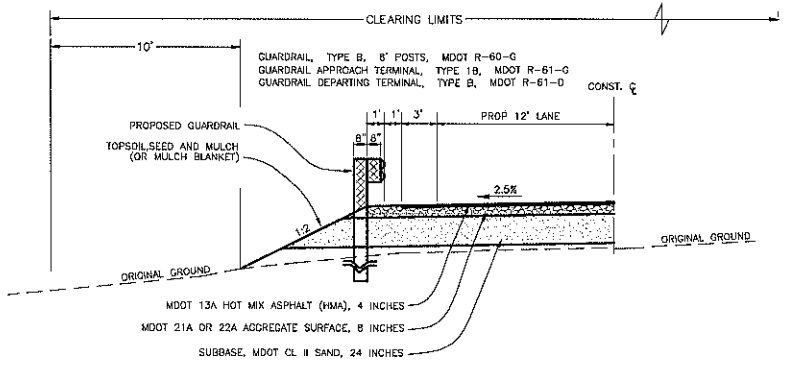
TYPICAL PAVEMENT ROAD SECTION

SCALE: NONE



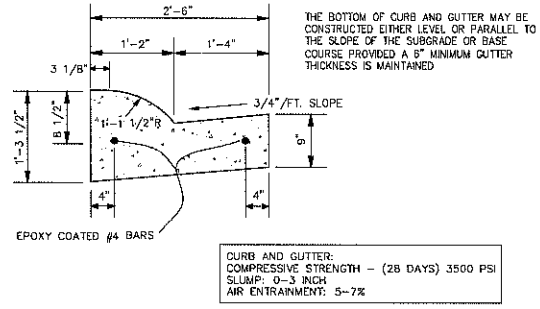
TYPICAL PAVEMENT ROAD SECTION - TRUCK CLIMBING LANE

SCALE: NONE



TYPICAL GUARDRAIL ROAD SECTION

SCALE: NONE



TYPICAL CONCRETE CURB B-2 DETAIL

SCALE: NONE

PROPOSED GUARDRAIL STATIONS

GUARDRAIL - LEFT			GUARDRAIL - RIGHT		
121+00	TO	128+00	121+00	TO	128+00
257+50	TO	280+00	258+00	TO	281+00
288+50	TO	291+00	288+50	TO	291+00
293+50	TO	299+00	296+50	TO	300+00
310+75	TO	312+75	310+75	TO	312+75
330+75	TO	335+50	330+75	TO	336+00
356+50	TO	359+25	356+50	TO	359+25
373+00	TO	374+50	373+00	TO	375+00
397+25	TO	402+75	387+00	TO	393+50
404+25	TO	410+75	397+25	TO	402+75
419+00	TO	422+00	404+25	TO	410+75
426+00	TO	428+00	419+00	TO	422+00
441+00	TO	443+00	426+00	TO	428+00
448+00	TO	449+00	441+00	TO	443+00
452+00	TO	458+00	448+00	TO	449+00
476+00	TO	478+50	452+00	TO	458+00
489+75	TO	494+50	476+00	TO	478+50
499+50	TO	503+50	489+75	TO	494+50
513+25	TO	518+00	499+50	TO	503+50
525+25	TO	527+00	513+25	TO	518+00
531+00	TO	533+00	525+25	TO	527+00
554+00	TO	562+00	531+00	TO	533+00
579+00	TO	582+50	554+00	TO	562+00
1125+00	TO	1134+00	579+00	TO	582+50
1138+00	TO	1142+50	1125+00	TO	1133+00
1147+50	TO	1150+00	1147+50	TO	1150+00
1196+75	TO	1198+50	1196+75	TO	1198+50
1204+00	TO	1208+50	1204+00	TO	1208+50
1217+00	TO	1227+00	1217+00	TO	1227+00
1239+50	TO	1241+25	1249+00	TO	1251+50
1249+00	TO	1251+50	1267+00	TO	1269+50
1267+00	TO	1270+00	1272+50	TO	1275+00
1291+50	TO	1310+50	1291+50	TO	1306+50
1321+50	TO	1325+50	1312+50	TO	1315+50
1335+50	TO	1345+00	1335+50	TO	1345+00
1351+00	TO	1361+00	1351+00	TO	1355+00
1372+00	TO	1376+00	1372+00	TO	1376+00
1403+00	TO	1405+00	1384+50	TO	1405+00
1417+00	TO	1432+00	1417+00	TO	1432+00
1436+50	TO	1439+50	1437+00	TO	1439+50
1443+50	TO	1447+50	1443+50	TO	1447+50
1458+00	TO	1462+50	1458+00	TO	1462+50
1465+25	TO	1467+25	1474+50	TO	1477+00
1474+50	TO	1477+00	1485+00	TO	1489+00
1485+00	TO	1489+00	1495+50	TO	1497+50
1495+50	TO	1497+50	1506+00	TO	1514+00
1510+50	TO	1517+00	1531+00	TO	1535+00
1531+00	TO	1535+00	1556+50	TO	1567+00
1559+00	TO	1567+00	1578+00	TO	1580+50
1603+00	TO	1657+50	1603+00	TO	1613+25
1662+00	TO	1668+50	1642+00	TO	1657+50
1706+00	TO	1716+00	1662+00	TO	1668+50
			1706+00	TO	1716+00

PROPOSED TRUCK PASSING LANE STATIONS

TRUCK CLIMBING LANES

319+00	TO	383+00 RT.
1260+00	TO	1299+00 LT.
1360+00	TO	1455+00 RT.
1591+00	TO	1647+00 LT.

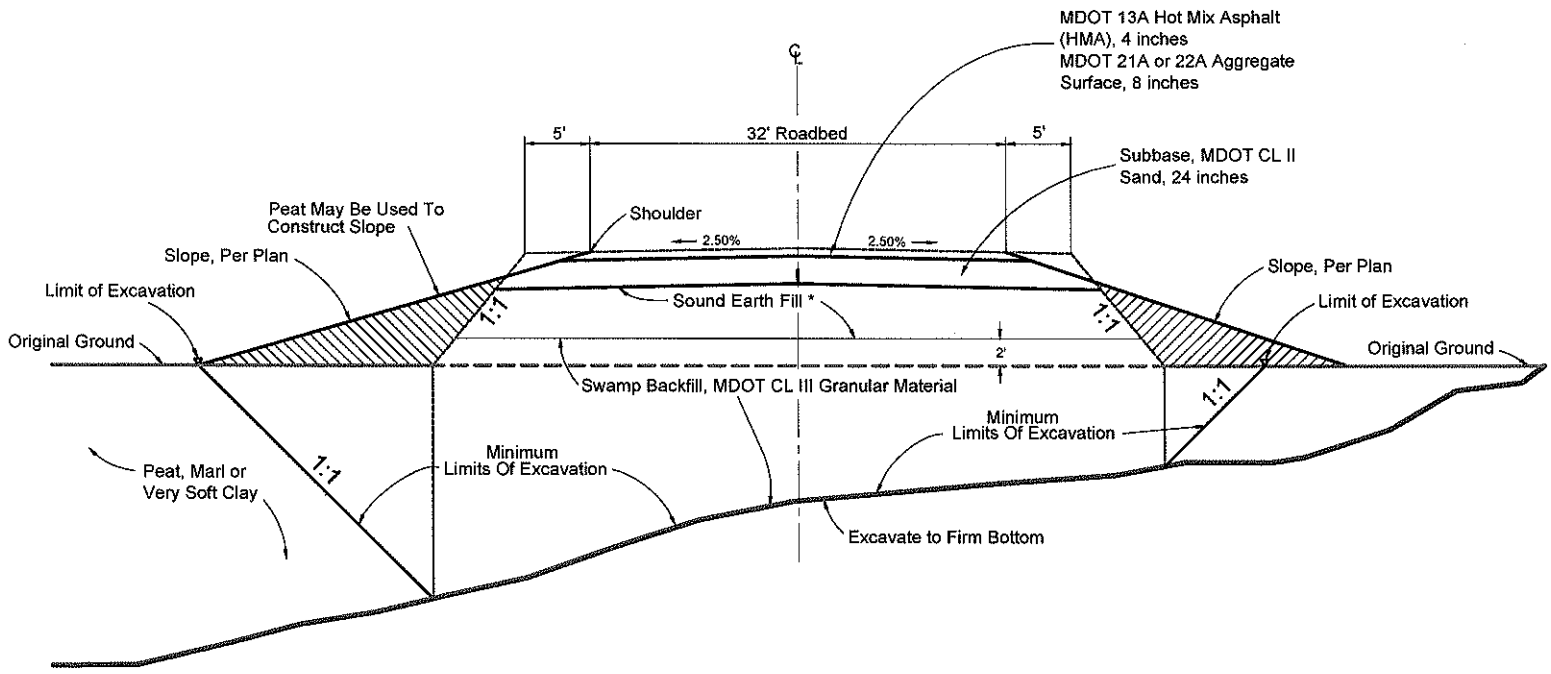
NOTE: 660' TAPER BEFORE AND AFTER THE ABOVE TRUCK CLIMBING LANE STATIONS

COLEMAN ENGINEERING COMPANY
635 CIRCLE DRIVE - IRON MOUNTAIN, MICHIGAN 49801 (906) 774-3440
200 EAST AYER STREET - IRONWOOD, MICHIGAN 49938 (906) 932-5048

TYPICAL SECTIONS
COUNTY ROAD 595 MARQUETTE COUNTY, MICHIGAN

CADD DRAWING: 595-TYPICAL
DATE: 12/19/11
D

Typical Peat Excavation

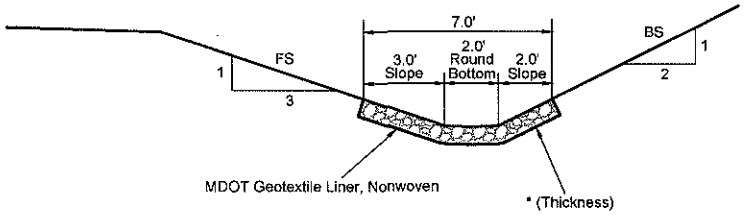


* Sound earth fill defined as:
Any natural or otherwise approved material, that can be compacted to the required density, contains no organic material, and has a maximum unit weight of at least 95 pounds per cubic foot.

COLEMAN ENGINEERING COMPANY 635 CIRCLE DRIVE -- IRON MOUNTAIN, MICHIGAN 49801 (906) 774-3440 200 EAST AYER STREET -- IRONWOOD, MICHIGAN 49938 (906) 932-5048	TYPICAL PEAT EXCAVATION COUNTY ROAD 595 MARQUETTE COUNTY, MICHIGAN	CADD DRAWING 595-DETAILS kipple	DATE: 1/09/12	E

2' Round Bottom Riprap Ditch (typ)

(7) Refers to Key Number in Runoff Plan Legend

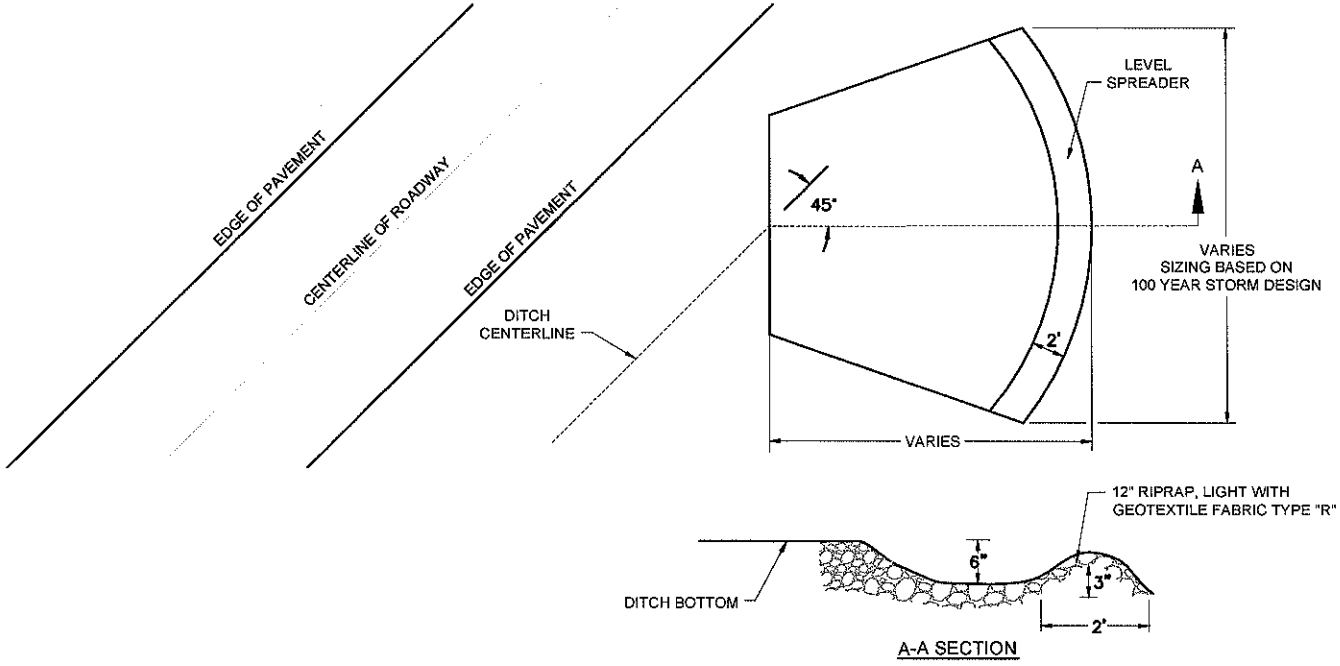


* MDOT Riprap, Plain, 8" minimum

* Grouted Riprap Outfalls Shall Be The Same As Plain Riprap Outfalls, Except the Riprap Shall Be Placed In A Layer Of Cement Mortar According To The Current MDOT Standard Specifications

Energy Dissipation Outfall

(19) Refers to Key Number in Runoff Plan Legend, As Modified Here



A-A SECTION

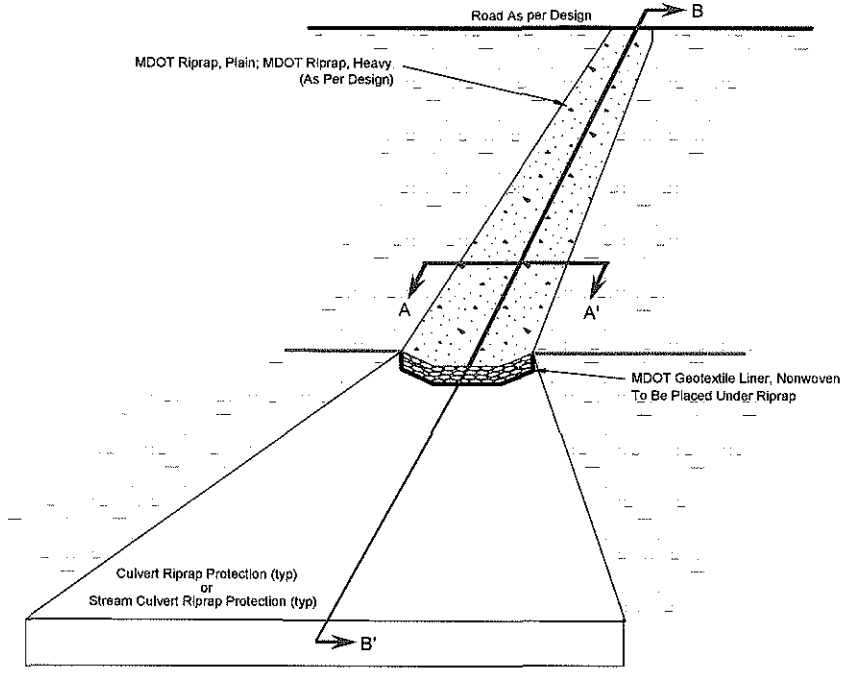
COLEMAN ENGINEERING COMPANY
635 CIRCLE DRIVE - IRON MOUNTAIN, MICHIGAN 49801 (906) 774-3440
200 EAST AYER STREET - IRONWOOD, MICHIGAN 49938 (906) 932-5048

TYPICAL RIPRAP DITCH
COUNTY ROAD 595 MARQUETTE COUNTY, MICHIGAN

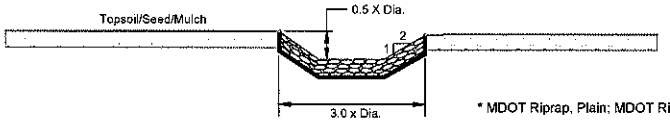
CADD DRAWING: 595 DETAILS kipple
DATE: 1/05/12
F

Typical Riprap Outfall

(53) Refers to Key Number in Runoff Plan Legend, As Modified Here



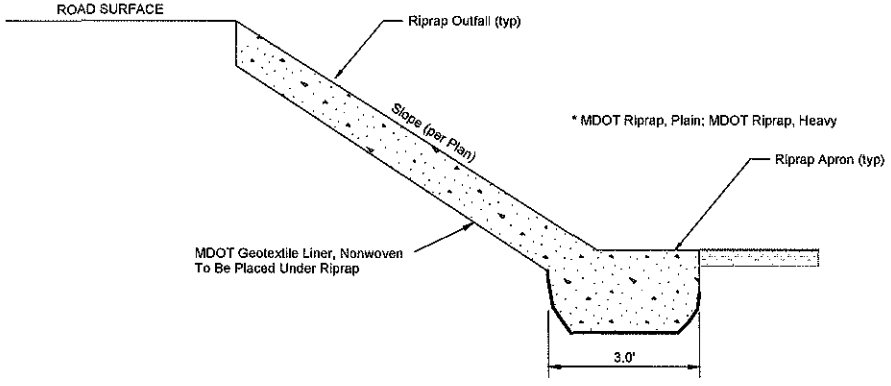
Section A - A'



* MDOT Riprap, Plain; MDOT Riprap, Heavy

* Grouted Riprap Outfalls Shall Be The Same As Plain Riprap Outfalls, Except the Riprap Shall Be Placed In A Layer Of Cement Mortar According To The Current MDOT Standard Specifications

Section B - B'



COLEMAN ENGINEERING COMPANY
635 CIRCLE DRIVE ~ IRON MOUNTAIN, MICHIGAN 49801 (906) 774-3440
200 EAST AYER STREET ~ IRONWOOD, MICHIGAN 49938 (906) 932-5048

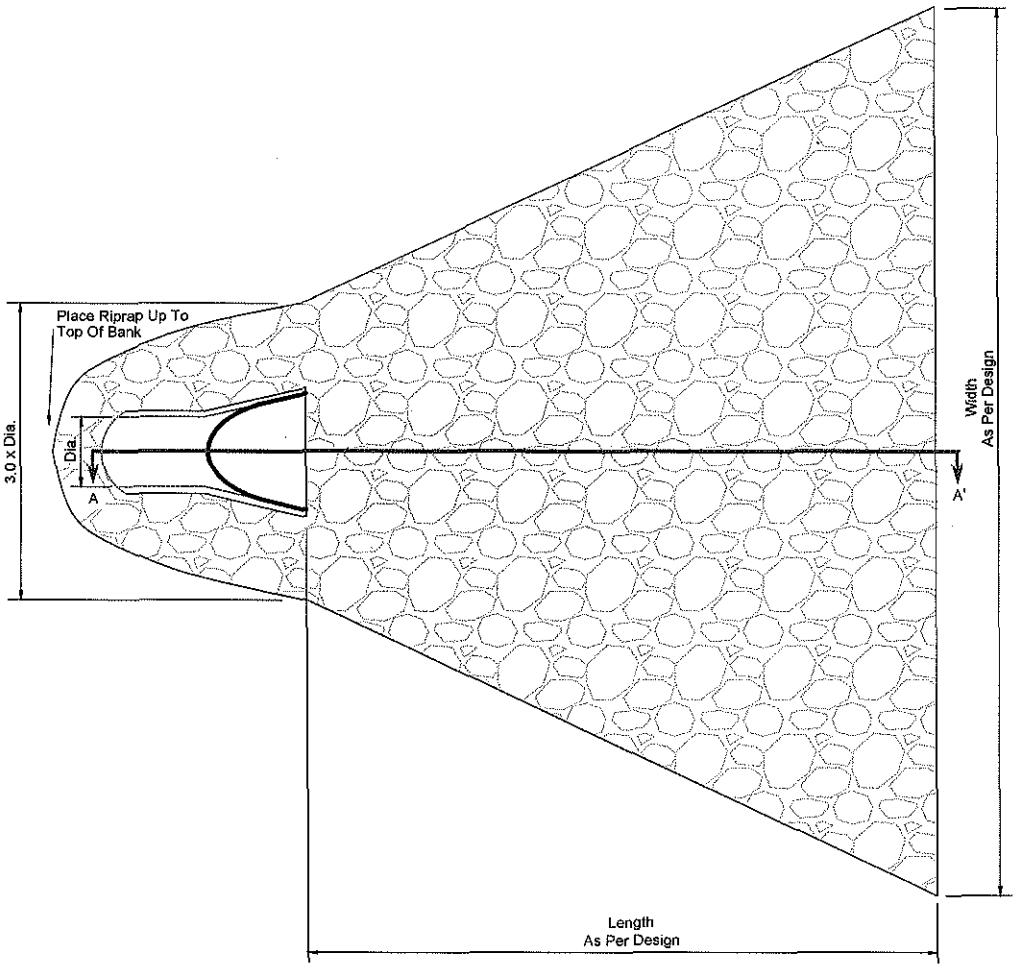
TYPICAL RIPRAP OUTFALL
COUNTY ROAD 595 MARQUETTE COUNTY, MICHIGAN

CADD DRAWING: 595 DETAILS kipple

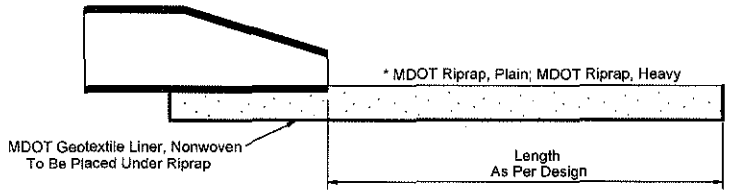
DATE: 12/15/11

G

Typical Upland Drainage Culvert Riprap Protection (typ)

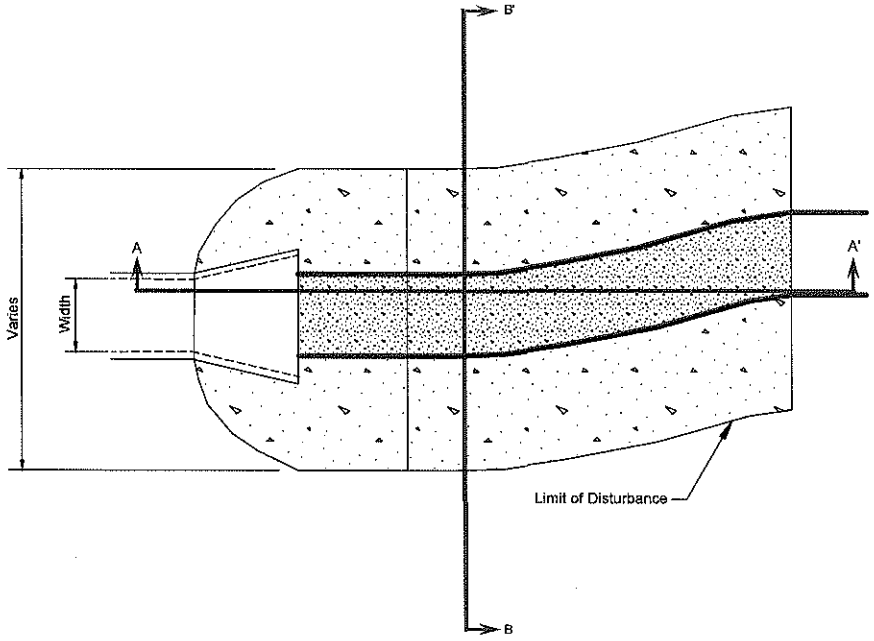


Section A - A'

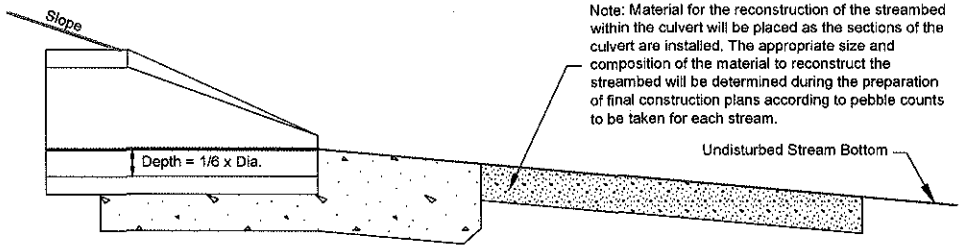


COLEMAN ENGINEERING COMPANY 635 CIRCLE DRIVE – IRON MOUNTAIN, MICHIGAN 49801 (906) 774-3440 200 EAST AYER STREET – IRONWOOD, MICHIGAN 49938 (906) 932-5048	TYPICAL CULVERT RIPRAP PROTECTION COUNTY ROAD 595 MARQUETTE COUNTY, MICHIGAN	CADD DRAWING 595 DETAILS kipple	DATE: 12/15/11	H

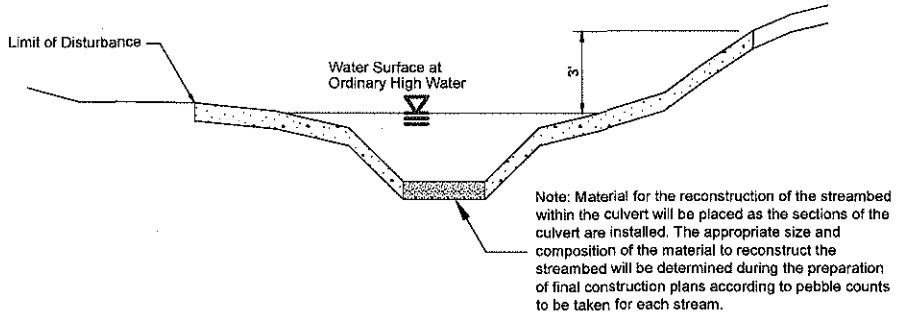
Typical Stream Culvert Riprap Protection



Section A - A'



Section B - B'



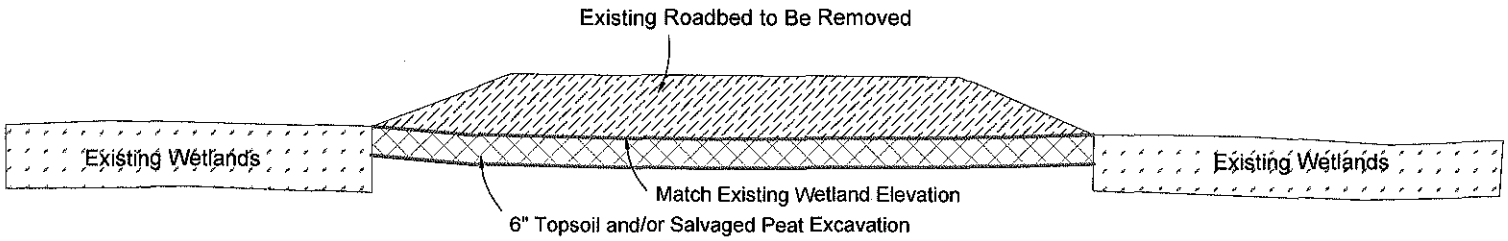
COLEMAN ENGINEERING COMPANY
635 CIRCLE DRIVE – IRON MOUNTAIN, MICHIGAN 49801 (906) 774-3440
200 EAST AYER STREET – IRONWOOD, MICHIGAN 49938 (906) 932-5048

TYPICAL STREAM CULVERT RIPRAP PROTECTION
COUNTY ROAD 595 MARQUETTE COUNTY, MICHIGAN

CADD DRAWING: 595 DETAILS kipple

DATE: 1/05/12

Typical Wetland Restoration



COLEMAN ENGINEERING COMPANY
635 CIRCLE DRIVE – IRON MOUNTAIN, MICHIGAN 49801 (906) 774-3440
200 EAST AYER STREET – IRONWOOD, MICHIGAN 49938 (906) 932-5048

TYPICAL WETLAND RESTORATION
COUNTY ROAD 595 MARQUETTE COUNTY, MICHIGAN

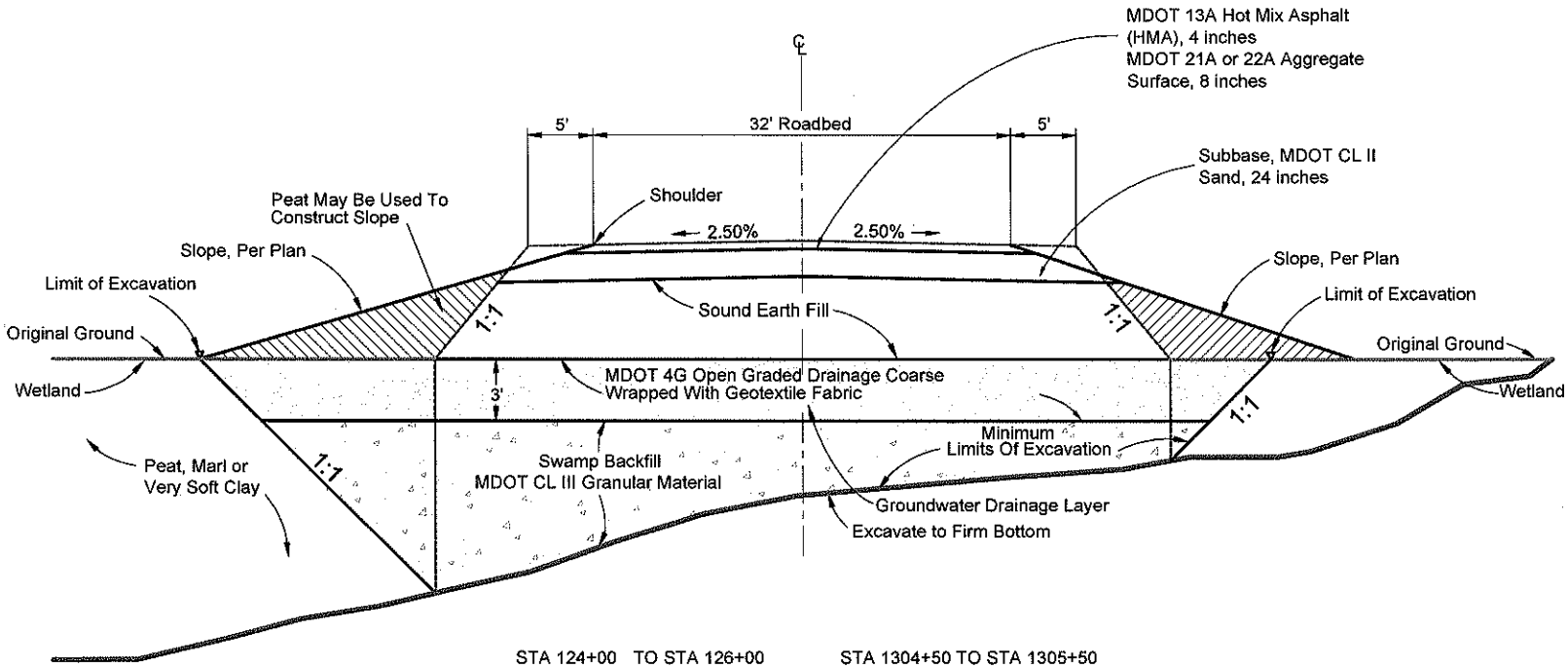
CADD DRAWING
595 DETAILS kipple

DATE:
1/12/12

J

Typical Groundwater Drainage Layer Detail

(51) Refers to Key Number in Runoff Plan Legend



STA 124+00 TO STA 126+00	STA 1304+50 TO STA 1305+50
STA 332+00 TO STA 333+00	STA 1313+00 TO STA 1313+75
STA 357+50 TO STA 358+50	STA 1460+00 TO STA 1461+00
STA 514+75 TO STA 515+25	STA 1475+00 TO STA 1476+00
STA 1126+00 TO STA 1127+00	STA 1663+00 TO STA 1664+00
STA 1224+50 TO STA 1225+25	STA 1667+00 TO STA 1668+00
STA 1299+50 TO STA 1300+50	STA 1710+00 TO STA 1712+00

* PROVIDE 50' TAPER FOR GROUNDWATER DRAINAGE LAYER BEFORE AND AFTER STATIONS LISTED ABOVE

* Sound earth fill defined as:
Any natural or otherwise approved material, that can be compacted to the required density, contains no organic material, and has a maximum unit weight of at least 95 pounds per cubic foot.

COLEMAN ENGINEERING COMPANY
635 CIRCLE DRIVE – IRON MOUNTAIN, MICHIGAN 49801 (906) 774-3440
200 EAST AYER STREET – IRONWOOD, MICHIGAN 49938 (906) 932-5048

TYPICAL GROUNDWATER DRAINAGE LAYER DETAIL
COUNTY ROAD 595 MARQUETTE COUNTY, MICHIGAN

CADD DRAWING	DATE:	
595 DETAILS kipple	1/09/12	K